



RRB Group D 2019

Level-1 Posts (Group D) · CEN RRC 01/2019 · CBT (17 Aug - 11 Oct 2022) · Mathematics · Question Paper

English

All 99 Shifts (Sets) · Mathematics Section · Official Answer Key

About this Compilation

This booklet contains all **99 shift papers** of the **RRB Group D 2019** examination in **English (Mathematics section only)**, with the correct option marked as per the official answer key.

✓ Correct option (highlighted green)

Source and order. Original question images of the official RRB response sheets (no retyping). RRB shuffled questions and options for every candidate; here each paper runs section by section in the official order (Maths Q1-25, Reasoning Q26-55, General Science Q56-80, General Awareness Q81-100), options in RRB's own order.

Answer key. Official RRB key; 12 questions carry RRB's final (post-objection) answer; 36 questions dropped by RRB are printed as asked, with RRB's note and no tick.

English not saved. For the whole 26 Aug 2022 12:45 PM paper and 149 questions of 17 other shifts no English version was saved; the Hindi version is printed, marked HINDI.

How to use

- Use the **Index** page to jump directly to any set (clickable).
- Questions appear section by section in the order of the paper, numbered 1 onward.
- Diagram and wide-table questions appear at full width at the end of their section.
- The correct answer is highlighted in green with a tick.

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Mathematics

25 Questions • Answer Key

Q1 Mathematics

If $x + y + z = 11$ and $xy + yz + zx = 42$, then the value of $x^2 + y^2 + z^2$ is:

A. 37



B. 39

C. 41

D. 43

Q2 Mathematics

P and Q alone can complete a piece of work in 9 days and 12 days, respectively. In how many days will the work be completed if they work on alternate days starting with Q?

A. $10\frac{1}{3}$ B. $10\frac{5}{6}$ C. $11\frac{1}{3}$ D. $11\frac{5}{6}$

Q3 Mathematics

Srinivas has just got married to a girl who is 4 years younger than him. After 5 years their average age will be 33 years. Find the present age of the girl.

A. 30 years

B. 26 years



C. 31 years

D. 35 years



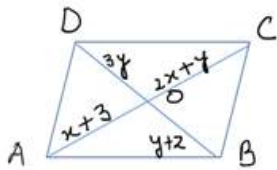
Q4 Mathematics

The greatest possible length which can be used to measure exactly the lengths 5 m 25 cm, 7 m 35 cm and 4 m 90 cm is:

- A. 35 cm
- B. 45 cm
- C. 25 cm
- D. 55 cm

Q5 Mathematics

Find x if ABCD is a parallelogram as given in figure below, with two diagonals AC and BD intersecting at O and $OA = x + 3$, $OB = y + 2$, $OC = 2x + y$, $OD = 3y$



- A. 1
- B. 2
- C. 3
- D. 4

Q6 Mathematics

The average speed of Gaurav during a two-way journey is 15 km/h. If he walked a distance of 20 km every hour while going, then his speed while returning will be:

- A. 10 km/h
- B. 15 km/h
- C. 12 km/h
- D. 11 km/h

Q7 Mathematics

The roots of the equation $ax^2 + x + b = 0$ are equal if:

- A. $b^2 = 4a$
- B. $b^2 < 4a$
- C. $b^2 > 4a$
- D. $ab = \frac{1}{4}$



Q8 Mathematics

Which is a quadratic equation?

A.) $b - \sqrt{3} + 2b - \sqrt{32} = 0$

B.) $(x - 4x^2 + 5) + \sqrt{3}x + 8 = 0$

C.) $(p - q)^2 - q^3 + 2pq - \sqrt{p} = -3$

D.) $(x + 3)^{\frac{1}{2}} = 0$

A. A

B. B



C. C

D. D

Q9 Mathematics

20 women can complete a work in 15 days. 16 men can complete the same work in 15 days. Find the ratio between the work efficiency of a men to a women .

A. 3: 2

B. 4: 3

C. 5: 4



D. 5: 3

Q10 Mathematics

John bought a laptop at 25% discount on the marked price. If he paid ₹28,473 for the laptop, what was its marked price?

A. ₹37,694

B. ₹37,964



C. ₹37,496

D. ₹37,946



Q11 Mathematics

A water tank is in the form of a cube of side 2 m. It has an inlet in the shape of a circle with radius 3.5 cm. How long will it take to fill the tank (approximately), if the water is flowing at a speed of 2 m/s?

- A. 22 minutes
- B. 19.2 minutes
- C. 17.3 minutes ✓
- D. 1 hour

Q12 Mathematics

One year ago, the ratio of the ages of Saketh and Tilak was 5 : 6, respectively. Four years hence, this ratio would become 6 : 7. The present age of Saketh is:

- A. 26 years ✓
- B. 30 years
- C. 25 years
- D. 31 years

Q13 Mathematics

Express $\sin \theta$ in terms of $\cot \theta$, where θ is an acute angle.

- A. $\frac{1}{\sqrt{1 + \cot^2 \theta}}$ ✓
- B. $\frac{1}{1 + \cot^2 \theta}$
- C. $1 + \cot^2 \theta$
- D. $\sqrt{1 + \cot^2 \theta}$

Q14 Mathematics

The value of $0.6 + \left(\sqrt{0.81} - (\sqrt{0.0144} + 0.4 \div 0.5) \right)$ is:

- A. 0.58 ✓
- B. 0.62
- C. 0.78
- D. 0.82



Q15 Mathematics

X and Y are two alloys of Gold and Platinum prepared by mixing the metals in the ratio of 5: 2 and 5: 7, respectively. If we melt equal quantities of the alloys to form a third alloy Z, then the ratio of the quantity of Gold to the quantity of Platinum in Z will be:

A. 73: 95

B. 95: 73



C. 84: 73

D. 95: 84

Q16 Mathematics

If 6, 18, 39, and x are in proportion, then find the value of x.

A. 139

B. 117



C. 112

D. 115

Q17 Mathematics

If the perimeter of one face of a cube is 24 cm, then its volume is:

A. 216 cm^3



B. 200 cm^3

C. 180 cm^3

D. 154 cm^3

Q18 Mathematics

The average of 11 numbers arranged in an order is 41. The average of the first five numbers is 18 and that of the last five numbers is 64. What is the sixth number?

A. 41



B. 45

C. 55

D. 64



Q19 Mathematics

The ages of two persons differ by 30 years. If 5 years ago, the elder one was 3 times as old as the younger one, then the present age of the younger person is:

A. 20 years



B. 30 years

C. 25 years

D. 35 years

Q20 Mathematics

Find the simple interest on ₹2,000 at 8.25% per annum for the period from 7 February 2022 to 20 April 2022.

A. ₹35

B. ₹33



C. ₹31

D. ₹37

Q21 Mathematics

If the cost price of an article is ₹2,500 and its selling price is ₹2,375, then the loss percentage is:

A. 3%

B. 4%

C. 5%



D. 6%

Q22 Mathematics

The value of

$$27 \div 3 - 27 \times 0 + 1 =$$

A. -18

B. 12

C. 10



D. 13



Q23 Mathematics

In $\triangle ABC$ if $\angle A = 40^\circ$ and $\angle B = 70^\circ$, find the measure of exterior angle A.

A. 110°

B. 140°



C. 30°

D. 70°

Q24 Mathematics

Convert 36 cm to km.

A. 0.0036 km

B. 0.00036 km



C. 0.00063 km

D. 0.000036 km

Q25 Mathematics

If the sum of two numbers is 430 and their HCF is 43, then which of the following is the correct pair?

A. 86, 344

B. 129, 301



C. 172, 258

D. 215, 215



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Mathematics

25 Questions · Answer Key

Q1 Mathematics

Last year, Ranjan's monthly salary was ₹34,500 and this year his monthly salary is ₹38,640. What is the percentage increase in Ranjan's monthly salary in this year over his monthly salary last year?

A. 12%



B. 13%

C. 15%

D. 20%

Q2 Mathematics

A, B and C started a business. They partnered for 6 months, 12 months and 14 months respectively. If their profit is in the ratio 5 : 4 : 7 respectively, then the ratio of their respective investments is _____.

A. 5 : 2 : 3



B. 2 : 3 : 5

C. 1 : 5 : 3

D. 2 : 3 : 7

Q3 Mathematics HINDI - no English version saved

36 संख्याओं का माध्य 42 पाया गया। बाद में, यह पता चला कि एक संख्या 47 को चूकवश 41 पढ़ा गया था। दी गई संख्याओं का सही माध्य ज्ञात कीजिए (दशमलव के दो स्थानों तक पूर्णांकित)।

A. 42.17



B. 42.83

C. 43.74

D. 43.62



Q4 Mathematics

Express $0.4\overline{24}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{41}{990}$

B. $\frac{41}{165}$

C. $\frac{13}{33}$

D. $\frac{14}{33}$ ✓

Q5 Mathematics HINDI - no English version saved

एक वस्तु को ₹1,920 में बेचने पर जेम्स द्वारा अर्जित प्रतिशत लाभ, उस वस्तु को ₹1,500 में बेचने पर हुई प्रतिशत हानि के बराबर है। यदि वह 10% लाभ अर्जित करना चाहता है, तो उसे उस वस्तु को किस विक्रय मूल्य पर बेचना चाहिए?

A. ₹4,000

B. ₹2,000

C. ₹1,881 ✓

D. ₹7,000

Q6 Mathematics HINDI - no English version saved

$(\sin^2 22^\circ + \sin^2 68^\circ)$ और $(\cos^2 33^\circ + \cos^2 57^\circ)$ का अनुपात ज्ञात कीजिए।

A. 1 : 4

B. 1 : 1 ✓

C. 2 : 1

D. 1 : 2



Q7 Mathematics HINDI - no English version saved

एक पाठ्यपुस्तक में कुल 892 पृष्ठ हैं। इसे दो भागों में बांटा गया है। पुस्तक के दूसरे भाग में, पहले भाग की तुलना में 52 पृष्ठ कम हैं। पुस्तक के दूसरे भाग में कितने पृष्ठ हैं?

A. 420



B. 472

C. 482

D. 464

Q8 Mathematics

Which of the following is divisible by both 4 and 8?

A. 8342

B. 3842

C. 4382

D. 3824



Q9 Mathematics

$6124.8 \times 625.5 \times 0.0043$ is equal in value to:

A. $6.1248 \times 62.55 \times 0.43$

B. $612.48 \times 625.5 \times 0.43$

C. $61.248 \times 6255 \times 0.043$



D. $6.1248 \times 62.55 \times 0.043$

Q10 Mathematics

Reena reaches a birthday party 20 min late if she walks 3 km/h from her house. If she increases her speed to 4 km/h she would reach 30 min early, then the distance between her house and the venue of the birthday party is

A. 4 km

B. 7 km

C. 9 km

D. 10 km



Q11 Mathematics

If the volume of a sphere is $36\pi \text{ cm}^3$, then the diameter of the sphere is:

A. 3 cm

B. 6 cm



C. 9 cm

D. 27 cm

Q12 Mathematics

When three parallel lines are cut by two transversals and the intercepts made by the first transversal are in the ratio 3 : 4, then the intercepts made by the second transversal are in the ratio _____.

A. 4 : 3

B. 2 : 4

C. 3 : 4



D. 1 : 1

Q13 Mathematics

Simplify $(3^2)^3 + (2^3)^2$.

A. 729

B. 379

C. 739

D. 793



Q14 Mathematics

5 men and 6 women can do a piece of work in 6 days while 3 men and 5 women can do the same work in 9 days. In how many days can 3 men and 2 women do the same work?

A. $10\frac{9}{11}$ days

B. $11\frac{5}{11}$ days



C. $12\frac{1}{11}$ days

D. $13\frac{3}{11}$ days



Q15 Mathematics HINDI - no English version saved

एक तल पर चार अलग-अलग बिंदु इस प्रकार हैं, कि कोई भी तीन बिंदु संरेख नहीं हैं। उनसे होकर खींची जा सकने वाली भिन्न ऋजु रेखाओं (distinct straight lines) की संख्या ज्ञात कीजिए।

A. 4

B. 8

C. 6



D. 2

Q16 Mathematics

The LCM of 48, 72 and another number, x , is 576. Which of the values given below can be the value of x ?

A. 96

B. 192



C. 144

D. 288

Q17 Mathematics

A is twice as old as B. B is $\frac{1}{3}$ as old as C. The sum of ages of A, B and C is 42 years, find the sum of the ages of A and B.

A. 15 years

B. 21 years



C. 23 years

D. 12 years

Q18 Mathematics

At simple interest, a certain sum of money amounts to ₹1,250 in 2 years and to ₹2,000 in 5 years. Find the rate of interest per annum (rounded off to two places of decimal).

A. 11.11%

B. 16.67%

C. 27.27%

D. 33.33%



Q19 Mathematics

Which of the following is the most beneficial for a customer?

Scheme 1.) Buy 5 get 3 free

Scheme 2.) Buy 5 get 6

Scheme 3.) Two successive discounts of 10% and 5%

A. Scheme 1



B. Scheme 1 and 2 both

C. Scheme 2

D. Scheme 2 and 3 both

Q20 Mathematics

14 years ago, the age of a father was three times the age of his son. Now, the father is twice as old as his son. What is the sum of the present ages of the father and the son?

A. 56 years

B. 84 years



C. 98 years

D. 42 years

Q21 Mathematics

What is the nature of the roots of $3x^2 + 6x - 5 = 0$?

A. The roots are real and equal.

B. The roots are real and distinct.



C. The roots are real and more than 2.

D. There are no real roots.

Q22 Mathematics

The expansion of $(3a - 4b - 2c)^2$ is:

A. $9a^2 + 16b^2 + 4c^2 - 24ab + 16bc - 6ac$

B. $9a^2 + 16b^2 + 4c^2 - 24ab + 8bc + 12ac$

C. $9a^2 + 16b^2 + 4c^2 - 24ab + 16bc - 12ac$



D. $9a^2 + 16b^2 + 4c^2 + 12ab - 8bc + 6ac$



Q23 Mathematics

Find the median of the data 11, 16, 33, 15, 51, 18, 71, 75, 22, 17.

A. 18

B. 22

C. 20



D. 24

Q24 Mathematics

Find the amount of water contained in a cylindrical tank of radius 7 m and height 20 m. It is known that the tank is completely filled.

A. 3080 m^3



B. 3125 m^3

C. 4250 m^3

D. 5110 m^3

Q25 Mathematics

The product of the roots of $3x^2 - 13x + 6 = 0$ is:

A. 4

B. 5

C. 2



D. 3



Mathematics

25 Questions • Answer Key

Q1 Mathematics

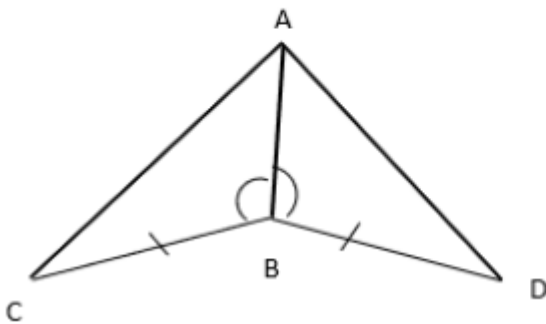
The HCF of two numbers is 7 and their LCM is 434. If one of the numbers is 14, find the other.

- A. 48
- B. 52
- C. 217
- D. 146



Q2 Mathematics

In the given figure $\angle ABC = \angle ABD$, $BC = BD$ then $\triangle CAB \cong \triangle$ -----



- A. ABD
- B. DBA
- C. ADB
- D. DAB



Q3 Mathematics

The age of a father six years ago was six times the then age of his daughter. Three years hence, the father will be thrice as old as his daughter. What is the present age of the daughter?

- A. 12 years
- B. 15 years
- C. 17 years
- D. 20 years



Q4 Mathematics

If $2^x \times 4^{12} \times 8^3 = 16^{11}$, then the value of x is:

A. 12

B. 11



C. 13

D. 14

Q5 Mathematics

A can finish painting a sari in 11 days, B in 20 days and C in 55 days, if they work independently. In how many days can the work be completed if A is assisted by B on every odd numbered day and by C on every even numbered day till the work completes?

A. 12 days

B. 8 days



C. 9 days

D. 18 days

Q6 Mathematics

A man invested ₹75,000 at the rate of $7\frac{1}{2}\%$ per annum simple interest for 6 years. Find the amount he will receive after 6 years.

A. ₹69,600

B. ₹1,08,750



C. ₹75,000

D. ₹1,12,500

Q7 Mathematics

The sum of the roots of the quadratic equation $4x^2 + 7x - 21 = 0$ is:

A. -21

B. $-\frac{21}{4}$

C. $-\frac{7}{4}$



D. $\frac{7}{4}$



Q8 Mathematics

What is the area of an equilateral triangle whose each side is 14 cm long?

A. $14\sqrt{3} \text{ cm}^2$

B. $35\sqrt{3} \text{ cm}^2$

C. $49\sqrt{3} \text{ cm}^2$ ✓

D. $21\sqrt{3} \text{ cm}^2$

Q9 Mathematics

A man travelled at a speed of 20 m/min for 100 min, and at a speed of 70 m/min for 50 min. His average speed is

A. $\frac{110}{3} \text{ m/min}$ ✓

B. $\frac{70}{3} \text{ m/min}$

C. 35 m/min

D. 25 m/min

Q10 Mathematics

If θ is an acute angle, find the denominator A, when

$$(\operatorname{cosec} \theta - \cot \theta)^2 = \frac{1 - \cos \theta}{A}$$

A. $1 + \cos \theta$ ✓

B. $1 + \sin \theta$

C. $\cot \theta$

D. $\operatorname{cosec} \theta - 1$

Q11 Mathematics

Aruna has a younger sister whose age is 8 years less than that of Aruna. If Aruna's sister's age is 18 years, then Aruna's age is:

A. 28 years

B. 24 years

C. 26 years ✓

D. 10 years



Q12 Mathematics

A cuboid of dimensions $18.5 \text{ cm} \times 12.5 \text{ cm} \times 10 \text{ cm}$ needs to be painted all over. Find the area to be painted.

- A. 1157.5 cm^2
- B. 984.56 cm^2
- C. 1082.5 cm^2 ✓
- D. 1198 cm^2

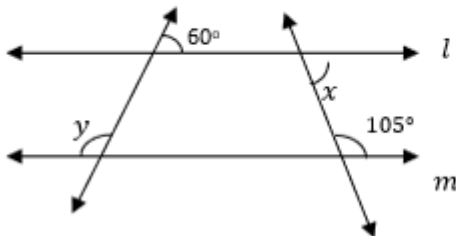
Q13 Mathematics

Venkat brought a second-hand scooter and spent 10% of the cost on its repairs. He sold the scooter for a profit of ₹2,200. How much did he spend on repairs if he made a profit of 20%?

- A. ₹400
- B. ₹750
- C. ₹1,200
- D. ₹1,000 ✓

Q14 Mathematics

In the adjoining figure line l is parallel to m . What is the value of $2x + y$?



- A. 270° ✓
- B. 225°
- C. 150°
- D. 320°

Q15 Mathematics

Find the number of 2-digit numbers divisible by both 2 and 4.

- A. 32
- B. 22 ✓
- C. 12
- D. 42



Q16 Mathematics

The present ages of Shanthi and Keerthi are in the ratio of 7 : 3. After 5 years, Shanthi's age will be 40. How old will Keerthi be after 5 years?

A. 15 years

B. 10 years

C. 20 years



D. 30 years

Q17 Mathematics

If the sum of the roots of the quadratic equation $5x^2 + bx + 4 = 0$ is 9, then find the value of b.

A. 20

B. -25

C. -45



D. 0

Q18 Mathematics

A man travels 80 km in three hours. He further travels for two more hours. Find the distance travelled in the latter two hours, if his average speed for the entire journey is 30 km/h.

A. 150 km

B. 120 km

C. 90 km

D. 70 km

**Q19** Mathematics

A shopkeeper sold a book at a loss of 14%. If the selling price had been increased by ₹100, there would have been a gain of 6%. What was the cost price of the book?

A. ₹650

B. ₹970

C. ₹500



D. ₹450



Q20 Mathematics

If $5 + x$, $2x + 7$, $6x + 9$, and y are in proportion when $x = 2$, find the value of y .

A. 28

B. 42

C. 33



D. 45

Q21 Mathematics

The value of $0.1\bar{6} + 0.1\bar{5} - 0.1\bar{3}$ is:

A. $\frac{23}{63}$

B. $\frac{34}{45}$

C. $\frac{19}{99}$

D. $\frac{17}{90}$



Q22 Mathematics

If $a : b = 2 : 3$ and $b : c = 3 : 4$, then $a : b : c = ?$

A. $3 : 2 : 4$

B. $2 : 4 : 3$

C. $2 : 3 : 4$



D. $3 : 4 : 2$

Q23 Mathematics

Ram is 55 years old and Som is 25 years old. How many years ago was Ram three times as old as Som?

A. 5 years

B. 7 years

C. 10 years



D. 15 years



Q24 Mathematics

X and Y can complete a piece of work in 8 days and 12 days, respectively. If they work on alternate days, with X working on the first day, how long will it take the duo to complete the same work?

A. $9\frac{2}{3}$ days

B. $9\frac{1}{2}$ days



C. $9\frac{3}{5}$ days

D. $9\frac{2}{5}$ days

Q25 Mathematics

If $\frac{x}{y} = \frac{3}{2}$, then find $\frac{x^2 + y^2}{x^2 - y^2}$.

A. $\frac{7}{5}$

B. $\frac{9}{5}$

C. $\frac{11}{5}$

D. $\frac{13}{5}$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A motor car starts with a speed of 60 km/h and increases its speed after every two hours by 15 km/h. In how much time will it cover a distance of 360 km?

A. 2 hours

B. 5 hours



C. 7 hours

D. 9 hours

Q2 Mathematics

A can count 100 eggs in 4 minutes while B can count the same number of eggs in 5 minutes. How much time will be required if they work together to count 450 eggs?

A. 5 min

B. 10 min



C. 15 min

D. 20 min

Q3 Mathematics

If three numbers are in the ratio 5 : 6 : 8 and the sum of their squares is 1250, then the product of those numbers is:

A. 2400

B. $2400\sqrt{10}$ 

C. 1200

D. $1200\sqrt{10}$

Q4 Mathematics

Find the area of a triangle whose sides are 12 m, 14 m and 16 m.

A. $21\sqrt{15} m^2$ B. $2\sqrt{15} m^2$ C. $7\sqrt{15} m^2$ D. $\sqrt{15} m^2$ 

Q5 Mathematics

Two boxes have chocolates in the ratio 7 : 5. If the difference in the number of chocolates is 28, find the number of chocolates in the box with larger numbers.

A. 98



B. 91

C. 84

D. 77

Q6 Mathematics

An item costs ₹2,000 less than ₹5,000. The dealer offers a discount of 10% and the retailer further offers a discount of 5% on its CP. The final SP for the customer is:

A. ₹2,565



B. ₹3,454

C. ₹2,878

D. ₹1,987

Q7 Mathematics

My father is presently 25 years older than me. The sum of our ages 5 years ago was 39 years. Find my present age.

A. 20 years

B. 15 years

C. 13 years

D. 12 years

**Q8 Mathematics**

One of the roots of the equation $x^2 - 12x + k = 0$ is $x = 3$. The other root is _____.

A. $x = -4$

B. $x = 9$



C. $x = 4$

D. $x = -9$



Q9 Mathematics

The area (in square units) of the quadrilateral ABCD, formed by the vertices A (0, -2), B (2, 1), C (0, 4), and D (-2, 1) is:

A. 12



B. 13

C. 14

D. 15

Q10 Mathematics

A group of class IX students conducted a survey for the number of family members in a household on 40 households in a locality, which resulted in the given frequency table. What is the mode of the data?

Family size	Number of families
2-4	10
4-6	8
6-8	12
8-10	6
10-12	4

A. 6.8



B. 6.6

C. 6.7

D. 6.9

Q11 Mathematics

If two parallel lines are intersected by a transversal, then which of the options below is not necessarily correct?

A. A pair of alternate interior angles have the same measure.

B. A pair of interior angles on the same side of the transversal have the same measure.



C. A pair of corresponding angles have the same measure.

D. A pair of vertically opposite angles have the same measure.

Q12 Mathematics

If a and b are the roots of $x^2 + x - 2 = 0$, then the quadratic equation in x whose roots are $\frac{1}{a} + \frac{1}{b}$ and ab is:

A. $2x^2 - 3x + 2 = 0$

B. $2x^2 + 5x - 2 = 0$

C. $2x^2 - 5x + 2 = 0$

D. $2x^2 + 3x - 2 = 0$



Q13 Mathematics

If the difference between two numbers is 52 and they are in the ratio 7 : 3, then find the greater of the two numbers.

- A. 65
- B. 70
- C. 84
- D. 91



Q14 Mathematics

A truck travels at a speed of 60 km/h from city P to city Q and returns to city P by the same route at a speed of 100 km/h. What is the average speed of the truck for the given journey?

- A. 80 km/h
- B. 75 km/h
- C. 70 km/h
- D. 85 km/h



Q15 Mathematics

In a clearance sale, a sari whose marked price was ₹10,490, is now sold for ₹9,441. What is the discount per cent on the sari?

- A. 12%
- B. 15%
- C. 18%
- D. 10%



Q16 Mathematics

A television costs ₹35,000 less than a printer. If the cost of the printer is twice the cost of the television, then the cost of the television is:

- A. ₹35,000
- B. ₹53,000
- C. ₹17,500
- D. ₹15,700



Q17 Mathematics

If x and y are the two digits of the number $115xy$ such that this number is divisible by 90, then the value of $x + y$ is:

A. 6

B. 3

C. 5

D. 2



Q18 Mathematics

The value of $5^3 \times 5^4 \times 5^2 = ?$

A. 5^6

B. 5^9



C. 5^7

D. 5^5

Q19 Mathematics

The HCF of any set of 10 co-prime numbers is always

A. 2

B. 0

C. 10

D. 1



Q20 Mathematics

The value of $0.0486 \div 0.002 =$

A. 18.7

B. 13.8

C. 24.3



D. 21.5



Q21 Mathematics

2.666 ... + 2.77 ... in fraction form is:

A. $\frac{31}{9}$

B. $\frac{29}{9}$

C. $\frac{49}{9}$ ✓

D. $\frac{47}{9}$

Q22 Mathematics

The value of $\sqrt{\frac{1-\cos \theta}{1+\cos \theta}}$ is:

A. $\operatorname{cosec} \theta - \cot \theta$ ✓

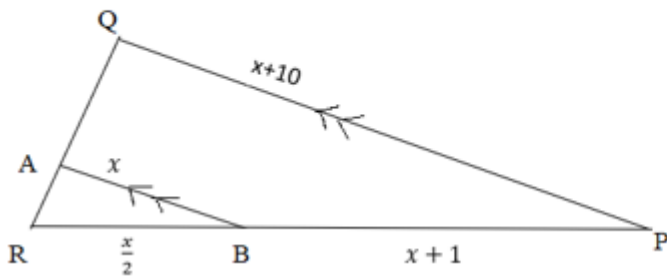
B. $\operatorname{cosec} \theta + \cot \theta$

C. $\sec \theta - \cot \theta$

D. $\sec \theta + \cot \theta$

Q23 Mathematics

In the given figure, $AB \parallel QP$, $AB = x$, $PQ = x + 10$, $RB = \frac{x}{2}$, $BP = x + 1$. Find PQ



A. 4 units

B. 18 units ✓

C. 13 units

D. 12 units



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Q24 Mathematics

The simple interest on ₹1,280 at 5% p.a. for 3 years is:

A. ₹195

B. ₹180

C. ₹192



D. ₹480

Q25 Mathematics

If $9 : 12 :: 12 : x$, and $28 : 42 :: 42 : y$, then the value of $2x + y$ is:

A. 79

B. 95



C. 84

D. 69



Mathematics

25 Questions • Answer Key

Q1 Mathematics

In how many years will a sum of ₹10,000 become ₹13,310 at 10% compound interest per annum, compounded annually?

A. 2

B. 3



C. 4

D. 5

Q2 Mathematics

The fraction equivalent to 0.474747... is:

A. $\frac{27}{100}$ B. $\frac{27}{9}$ C. $\frac{11}{27}$ D. $\frac{47}{99}$ 

Q3 Mathematics

If $a + b = 56$ and $(a - b)^2 = 496$, find the value of product of a and b.

A. 660



B. 560

C. 760

D. 460

Q4 Mathematics

A and B invest ₹42,000 and ₹56,000 respectively, in a business. At the end of the year they make a profit of ₹87,220. Find B's share in the profit.

A. ₹49,840



B. ₹48,480

C. ₹45,620

D. ₹47,240



Q5 Mathematics

If each interior angle of a regular polygon is 135° , then the number of sides that polygon has is:

A. 8



B. 10

C. 12

D. 15

Q6 Mathematics

The area (in square units) of the triangle formed by the vertices (0,2), (2,3) and (3,1) is:

A. 5.5

B. 4.4

C. 3.5

D. 2.5



Q7 Mathematics

A class of 30 students appeared in a test. The average score of 12 students is 80, and that of the rest is 75. What is the average score of the class?

A. 87

B. 67

C. 56

D. 77



Q8 Mathematics

If $x^2 + 2x + 9 = (x - 2)(x - 3)$, then the resultant equation is:

A. a quadratic equation

B. a cubic equation

C. not a quadratic equation



D. a cubic polynomial



Q9 Mathematics

Two pipes X and Y can fill a cistern in 21 hours and 24 hours, respectively. The pipes are opened simultaneously and it is found that due to a leakage in the bottom it takes 48 minutes more to fill the cistern. When the cistern is full, in how much time will the leak empty it if no pipe is open during that time?

- A. 120 hours
- B. 168 hours
- C. 144 hours
- D. 130 hours

**Q10 Mathematics**

Which of the following is the greatest number that divides 72 and 119 and leaves 3 and 4 as respective remainders?

- A. 23
- B. 19
- C. 21
- D. 17

**Q11 Mathematics**

If $3x - 2y = 10$ and $xy = 11$, the value of $27x^3 - 8y^3$ is _____

- A. 2980
- B. 3170
- C. 2569
- D. 3336

**Q12 Mathematics**

A vendor sold 25 laptops at a profit of 12% and 15 laptops at a profit of 20%. If he had sold all the 40 laptops at a profit of 18%, his profit would have increased by ₹30,000. What is the cost price of each laptop, if the cost price of all the 40 laptops is the same?

- A. ₹28,000
- B. ₹27,000
- C. ₹26,000
- D. ₹25,000



Q13 Mathematics

If $\sec 4A = \operatorname{cosec} (3A - 50^\circ)$, where $4A$ and $3A$ are acute angles, find the value of $A + 75$.

A. 78°

B. 67°

C. 105°

D. 95°



Q14 Mathematics

The sum of ages of P and Q is 15 years more than the sum of ages of Q and R. How many years younger is R as compared to P?

A. 12

B. 13

C. 15



D. 19

Q15 Mathematics

How many seconds will a boy take to run one complete round around a square field of side 38 metres, if he runs at a speed of 6 km/h?

A. 50.1

B. 61.2

C. 71.2

D. 91.2



Q16 Mathematics

The smallest natural number that must be added to 1212 to make it a perfect square is:

A. 13



B. 24

C. 27

D. 18



Q17 Mathematics

Two angles are complementary. The larger angle is 6° less than thrice the measure of the smaller angle. What is the measure of the larger angle?

A. 54°

B. 57°

C. 63°

D. 66° ✓

Q18 Mathematics

If $AB = x + 3$, $BC = 2x$ and $AC = 4x - 5$, then for what value of 'x' does B lie on AC?

A. 2

B. 3

C. 5

D. 8 ✓

Q19 Mathematics

The diagonal and one side of a rectangular plot are 65 m and 63 m, respectively. What is the perimeter of the rectangular plot?

A. 256 m

B. 225 m

C. 196 m

D. 158 m ✓

Q20 Mathematics

If 10% of 24% of x is 240, then $x = ?$

A. 100

B. 10000 ✓

C. 1000

D. 100000



Q21 Mathematics

Which of the following pairs of numbers are co-primes?

A. 12 and 18

B. 34 and 35



C. 7 and 14

D. 17 and 170

Q22 Mathematics

Find the smallest number by which 6300 must be multiplied to make it a perfect square.

A. 6

B. 7



C. 12

D. 15

Q23 Mathematics

A man buys 15 identical articles for a total of ₹15. If he sells each of them for ₹1.23, then his profit percentage is:

A. 23%



B. 8%

C. 32%

D. 50%

Q24 Mathematics

Find the mode of the data 2, 2, 3, 5, 15, 15, 15, 20, 21, 23, 25, 15, 23, 25.

A. 21

B. 15



C. 23

D. 25



Find the roots of $\frac{6}{x} - \frac{2}{x-1} - \frac{1}{x-2} = 0$.

A. $\frac{4}{3}$ and $\frac{3}{2}$

B. $\frac{4}{5}$ and 3

C. $\frac{4}{3}$ and 3



D. $\frac{4}{5}$ and $\frac{3}{2}$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A group of people contains men, women and children. If 40% of them are men, 35% are women and rest are children, and their average weights are 70 kg, 60 kg and 30 kg, respectively. The average weight of the group is:

- A. 56.5 gm
- B. 45.5 gm
- C. 45.5 kg
- D. 56.5 kg



Q2 Mathematics

A shadow of a tower standing on a level ground is found to be $40\sqrt{3}$ meters longer when the Sun's altitude is 30° than when it is 60° . The height of the tower is:

- A. 40 m
- B. 60 m
- C. 50 m
- D. 70 m



Q3 Mathematics

A sum, when invested at $12\frac{1}{2}\%$ simple interest per annum, amounts to ₹8,250 after 2 years. What is the simple interest?

- A. ₹1,650
- B. ₹1,700
- C. ₹1,820
- D. ₹1,910



Q4 Mathematics

Simplify: $6(x^3 - 2x^2 + 3x) - (x^3 + 2x - 3)$.

- A. $5x^3 - 12x^2 + 16x + 3$
- B. $5x^3 - 12x^2 + 16x - 3$
- C. $5x^3 + 12x^2 + 16x + 3$
- D. $5x^3 + 12x^2 + 16x - 3$



Q5 Mathematics

The sum of two numbers is 32 and one of them exceeds the other by 18. Find the greater number.

A. 24

B. 28

C. 27

D. 25

**Q6 Mathematics**

If $40 : 35 :: 35 : x$, find the value of x .

A. $\frac{49}{16}$ B. $\frac{245}{8}$ C. $\frac{49}{14}$ D. $\frac{49}{8}$ **Q7 Mathematics**

Simplify $\frac{8^2 \times 3^3}{\sqrt{64} \times \sqrt{81}}$.

A. 27

B. 72

C. 64

D. 24

**Q8 Mathematics**

Raju and Raman can complete a piece of work in 12 days and 16 days, respectively. If they work on alternate days, starting with Raju, in how many days will the work be completed?

A. $13\frac{1}{3}$ daysB. $13\frac{2}{3}$ daysC. $14\frac{1}{3}$ daysD. $14\frac{2}{3}$ days

Q9 Mathematics

The sum of the present ages of a father and his daughter is 80 years. Eight years ago, the father's age was seven times the age of his daughter. Eight years from now, what will be the daughter's age?

A. 24 years



B. 22 years

C. 20 years

D. 18 years

Q10 Mathematics

The difference between the selling price on a discount of 32% and two successive discounts of 20% each on a certain bill is ₹25. Find the actual amount of the bill.

A. ₹200

B. ₹425

C. ₹625



D. ₹576

Q11 Mathematics

A car can cover 275 km in 5 hours. If its speed is reduced by 5 km/h, then how much time will the car take to cover a distance of 250 km?

A. 4 hr 30 min

B. 5 hr



C. 5 hr 30 min

D. 6 hr

Q12 Mathematics

What is the nature of the roots of the quadratic equation $x^2 - 5x + 7 = 0$?

A. Not real



B. Real, irrational, unequal

C. Real, rational, unequal

D. Real, rational, equal



Q13 Mathematics

Which of the following pairs is NOT coprime?

A. (15, 17)

B. (11, 13)

C. (17, 23)

D. (17, 34) ✓

Q14 Mathematics

The total surface area of a cylinder of diameter 10 cm is 330 square centimeters. Find the height of the cylinder?

A. 2.5 cm

B. 5.5 cm ✓

C. 6.5 cm

D. 10.5 cm

Q15 Mathematics

Find the roots of the equation $6p^2 - 5p - 6 = 0$.

A. $-\frac{2}{3}$ and $\frac{3}{2}$ ✓

B. $\frac{2}{3}$ and $\frac{2}{3}$

C. $\frac{3}{4}$ and $\frac{3}{2}$

D. $-\frac{1}{3}$ and $\frac{4}{3}$

Q16 Mathematics

Find the number of sides in a regular polygon if its each interior angle is 160° .

A. 14

B. 15

C. 17

D. 18 ✓



Q17 Mathematics

A shopkeeper sells an item at a profit of 25% and dishonestly uses a weight that is 30% less than the actual weight. Find his total profit%.

A. 65.75%

B. 42%

C. 23%

D. 78.57% ☒**Q18** Mathematics

Mohit's salary is ₹15,000 per month. He spends ₹5,000 on house rent, ₹2,000 on bills and rest of the amount is his monthly savings. Find his savings in a year, if in the month of his birthday he spent his complete monthly saving for birthday celebration.

A. ₹88,000 ☒

B. ₹96,000

C. ₹8,000

D. ₹17,000

Q19 Mathematics

If $d^2 + \frac{1}{d^2} = 18$, and $d > \frac{1}{d}$ then the value of $d^3 - \frac{1}{d^3}$ is:

A. 76 ☒

B. 81

C. 91

D. 64

Q20 Mathematics

Simplify $\left(\frac{1}{3}\right)^{-3} + \left(\frac{1}{5}\right)^{-4} + \left(\frac{1}{15}\right)^{-2}$.

A. 777

B. 877 ☒

C. 756

D. 856



Q21 Mathematics

Find the value of $325 \times 5 + 31 \times 21 - 22 \times (63 - 52)$.

A. 2034



B. 2044

C. 2024

D. 2014

Q22 Mathematics

Find the median class of:

CI	0-50	50-100	100-150	150-200
F	12	15	13	10

A. 0-50

B. 50-100



C. 100-150

D. 150-200

Q23 Mathematics

The parallel sides of a trapezium and its height are in an arithmetic progression with a common difference of 4. If the height is the highest term and the area of the trapezium is 160 sq. units, find the ratio of length of greatest parallel side to that of the smallest parallel side.

A. 5: 1

B. 1: 5

C. 3: 2



D. 2: 3

Q24 Mathematics

The HCF of 108 and 144 is _____

A. 36



B. 12

C. 24

D. 16



Q25 Mathematics

How many spherical solid marbles, each having a radius of 0.3 cm, can be made from a solid sphere having a radius of 6 cm?

A. 9000

B. 8500

C. 8000



D. 7500



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Rani borrowed an amount of ₹2,00,000 from the bank to start a business. How much simple interest will she pay at the rate of 7% per annum after 2 years?

- A. ₹26,000
- B. ₹24,000
- C. ₹28,000
- D. ₹28,500



Q2 Mathematics

The diagonal of a quadrilateral is 32 m long, and its two offsets are 6 m and 10 m long. The area of the quadrilateral is

- A. 220 m^2
- B. 250 m^2
- C. 256 m^2
- D. 276 m^2



Q3 Mathematics

Find the nature of the roots of $x^2 - 14x + 49 = 0$

- A. No real roots
- B. Real and equal roots
- C. Distinct roots
- D. Imaginary roots



Q4 Mathematics

Simplify: $3x(x - 6) + x^2 + 6x - 9 + 24 - x^3$.

- A. $15 + 12x + 4x^2 - x^3$
- B. $15 - 12x + 4x^2 - x^3$
- C. $15 + 12x + 4x^2 + x^3$
- D. $15 - 12x + 4x^2 + x^3$



Q5 Mathematics

A father is presently 3 times his daughter's age. After 10 years he will be twice as old as her. Find the daughter's present age.

- A. 5 years
- B. 10 years
- C. 15 years
- D. 20 years

**Q6 Mathematics**

A number, when divided by the sum of 335 and 265, gives three times the difference between 335 and 265 as the quotient and 35 as the remainder. What is that number?

- A. 124535
- B. 128235
- C. 126035
- D. 127535

**Q7 Mathematics**

Two numbers are in the ratio 5: 7. If their HCF is 17, then find the numbers.

- A. 68, 85
- B. 85, 102
- C. 102, 136
- D. 85, 119

**Q8 Mathematics**

Find the value of $2\sec^2 A + 4\operatorname{cosec}^2 A - 2\tan^2 A - 4\cot^2 A$.

- A. 2
- B. 4
- C. 6
- D. 8



Q9 Mathematics

Simplify: $6^2 + 7^2 + \sqrt{16}$

A. 98

B. 89

C. 94

D. 80

Q10 Mathematics

In $\triangle ABC$ and $\triangle DEF$, $\angle A = 40^\circ$, $\angle B = 55^\circ$, $\angle D = 55^\circ$, $\angle E = 85^\circ$ and $m(\overline{AB}) = m(\overline{FD})$. Then which of the options below is correct?

A. $\triangle ABC \cong \triangle FDE$

B. $\triangle ABC \cong \triangle DFE$

C. $\triangle ABC \cong \triangle FED$

D. $\triangle ABC \cong \triangle EDF$

Q11 Mathematics

Simplify $1.\overline{24}$ as an improper fraction.

A. $\frac{41}{33}$

B. $\frac{124}{99}$

C. $\frac{123}{90}$

D. $\frac{91}{90}$

Q12 Mathematics

Ravi started a business by investing ₹50,000. After six months Raju joined him and invested an amount of ₹1,00,000. In one year since Ravi invested, they earned a profit of ₹63,000. What is Raju's share of the profit?

A. ₹31,500

B. ₹32,500

C. ₹32,000

D. ₹31,000



Q13 Mathematics

A student scored 80/80 marks in term 1 and 75/90 marks in term 2. What will be his percentage of final score, if the weightage given to the terms is 40% and 60%, respectively. (correct to the nearest integer)

A. 70%

B. 95%

C. 90%



D. 85%

Q14 Mathematics

The population of a town is 2,24,375. If it increases at the rate of 4% per annum, what will be its population 2 years hence?

A. 2,32,846

B. 2,36,864

C. 2,40,468

D. 2,42,684

**Q15** Mathematics

A triangle has sides of length 5 cm, 7 cm and 10 cm. Find the area of the triangle (in cm^2).

A. 25

B. $2\sqrt{66}$ C. $7\sqrt{10}$

D. 350



Q16 Mathematics

The value of $\left(a + \frac{1}{b}\right)^r \left(a - \frac{1}{b}\right)^s \div \left(b + \frac{1}{a}\right)^r \left(b - \frac{1}{a}\right)^s$ is:

A. $\left(\frac{a}{b}\right)^{r+s}$



B. $\left(\frac{b}{a}\right)^{r+s}$

C. $(ab)^{r+s}$

D. $\frac{a^r}{b^s}$

Q17 Mathematics

A blanket is sold for ₹1,148, which results in a loss of 30%. For how much should it be sold to gain 5%?

A. ₹1,734

B. ₹1,423

C. ₹1,543

D. ₹1,722



Q18 Mathematics

Kohli is younger than Rohit by 3 years. If the ages of Kohli and Rohit are in the ratio 7 : 8, how old is Kohli?

A. 18 years

B. 27 years

C. 21 years



D. 24 years

Q19 Mathematics

For a trip of 800 km, a truck travels the first 300 km at a speed of 50 km/h. At what speed should it cover the remaining distance, so that the average speed is 60 km/h?

A. $\frac{600}{13}$ km/h

B. 52 km/h

C. $\frac{750}{11}$ km/h



D. 72 km/h



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Q20 Mathematics

If two angles of a triangle measure 60° and 80° , respectively, then the measure of the third angle of this triangle is:

A. 40° ✓

B. 50°

C. 60°

D. 70°

Q21 Mathematics

The price of an article is increased by 20% and then two successive discounts of 5% each are allowed. The selling price of the article is _____ above its cost price.

A. 9.2%

B. 6.9%

C. 7.8%

D. 8.3% ✓

Q22 Mathematics

Find the quadratic equation that has $(1 + \sqrt{3})$ as one of its roots.

A. $x^2 + \sqrt{3}x + 1 = 0$

B. $x^2 - 2x - 2 = 0$ ✓

C. $x^2 + 2x + 1 = 0$

D. $x^2 + 2x + 2 = 0$

Q23 Mathematics

A 210 m long train crosses a man walking at a speed of 4.5 km/h in the opposite direction in 12 seconds. What is the speed (in km/h) of the train?

A. 58.5 ✓

B. 59.5

C. 60.5

D. 61.5



Q24 Mathematics

A 91 cm-long wire is cut into two pieces so that one piece length is three-fourth of the other. Find the length of the shorter piece.

A. 39 cm



B. 36.23 cm

C. 42.17 cm

D. 38 cm

Q25 Mathematics

Two trains of equal speed are running in opposite directions. If their lengths are 120 metres and 140 metres and they cross each other in 10 sec, then find the speed of each train.

A. 10 m/s

B. 13 m/s



C. 14 m/s

D. 16 m/s



Mathematics

25 Questions • Answer Key

Q1 Mathematics

If $(x + \frac{1}{x}) = k$, find the value of $x^3 + \frac{1}{x^3}$.

A. $k^3 + 3k$

B. $k^3 - 3k$ ✓

C. $3k - k^3$

D. k^3

Q2 Mathematics

The value of $\frac{\sin^2 10^\circ + \sin^2 20^\circ + \sin^2 30^\circ + \sin^2 40^\circ + \sin^2 50^\circ + \sin^2 60^\circ + \sin^2 70^\circ + \sin^2 80^\circ + \sin^2 90^\circ}{\cos^2 20^\circ + \cos^2 40^\circ + \cos^2 50^\circ + \cos^2 70^\circ + \cot^2 45^\circ}$ is:

A. $\frac{5}{3}$ ✓

B. $\frac{3}{4}$

C. $\frac{6}{5}$

D. $\frac{4}{3}$

Q3 Mathematics

The equation $x^2 + 7x + 6 = 0$ can be written as:

A. $(x - 1)(x + 6) = 0$

B. $(x + 1)(x - 6) = 0$

C. $(x - 1)(x - 6) = 0$

D. $(x + 1)(x + 6) = 0$ ✓



Q4 Mathematics

The volume of a cylinder is 5500 m^3 . Find its diameter if the cylinder is 70 m high.

- A. 5 m
- B. 8 m
- C. 10 m
- D. 12 m

**Q5 Mathematics**

The equivalent fraction of $4.2222\ldots$ is:

- A. $\frac{38}{9}$
- B. $\frac{38}{100}$
- C. $\frac{422}{99}$
- D. $\frac{42}{99}$

**Q6 Mathematics**

Two numbers are in the ratio 5: 3. If difference between the numbers is 54, then find the smaller number.

- A. 135
- B. 91
- C. 115
- D. 81

**Q7 Mathematics**

Simplify $3(3x - 2) + x\left(\frac{4x}{2}\right) + 15 - 12$.

- A. $2x^2 + 9x + 3$
- B. $2x^2 + 6x - 3$
- C. $2x^2 + 9x + 6$
- D. $2x^2 + 9x - 3$



Q8 Mathematics

A shop which sells sarees had offers going on wherein customers could buy 3 sarees and get 2 free. What is the discount that the customer gets?

A. 40%



B. 50%

C. 60%

D. 30%

Q9 Mathematics

51 men can complete a work in 12 days. Four days after they started working 6 more men joined them. How many days will they now take to complete the remaining work?

A. $5\frac{9}{19}$ days

B. $7\frac{3}{19}$ days



C. $8\frac{1}{19}$ days

D. $6\frac{7}{19}$ days

Q10 Mathematics

The sum of double of the largest two-digit prime number and triple of the largest three-digit prime number is equal to _____

A. 3029

B. 3185



C. 2195

D. 6523

Q11 Mathematics

Which of the following is NOT a true statement?

A. All rectangles are parallelograms.

B. Opposite sides of a rectangle are congruent and parallel.

C. Diagonals of a rectangle do not bisect each other.



D. Sum of any pair of adjacent angles of a rectangle is 180° .



Q12 Mathematics

The mean proportional between the numbers p and q is 8. Which of the following pairs of numbers can be the values of p and q ?

- A. 10 and 6
- B. 12 and 3
- C. 16 and 4
- D. 12 and 16

**Q13** Mathematics

A starts from X at 9:00 a.m. and reaches Y at 1:00 p.m., on the same day, B also starts from Y at 9:00 a.m. and reaches X at 3 p.m on the same day, following the same route as A. At what time do the two meet?

- A. 10:00 hrs
- B. 11:12 hrs
- C. 11:30 hrs
- D. 11:24 hrs

**Q14** Mathematics

The mean proportional of 16 and 144 is

- A. 44
- B. 48
- C. 34
- D. 36

**Q15** Mathematics

The average of the first twelve multiples of 11 is:

- A. 71.5
- B. 70.5
- C. 69.5
- D. 68.5



Q16 Mathematics

From the numbers 51, 52, 53,100, find the sum of the smallest and the greatest prime numbers as given.

A. 154

B. 123

C. 139

D. 150

**Q17** Mathematics

3 pencils and 5 pens together cost ₹81, whereas 5 pencils and 3 pens together cost ₹71. The cost of 1 pencil and 2 pens together is:

A. ₹31

B. ₹26

C. ₹35

D. ₹29

**Q18** Mathematics

For a grouped data, if X_i is the class mark and f_i is the corresponding frequency, then by direct method, mean x is given by:

A. $\frac{\sum f_i x_i}{\sum x_i}$ B. $\frac{\sum x_i}{\sum f_i}$ C. $\frac{\sum f_i x_i}{\sum f_i}$ D. $\sum f_i x_i$ **Q19** Mathematics

In a right-angled triangle, if the hypotenuse is 4 units greater than one side and 8 units greater than the other, then find the area of the triangle.

A. 32 sq. units

B. 100 sq. units

C. 16 sq. units

D. 96 sq. units



Q20 Mathematics

Simplify $234 \times [8 - (6 + 2) \times 3] + 4234$.

A. 423

B. 324

C. 490



D. 940

Q21 Mathematics

The product of the roots of $x^2 - 7x + 12 = 0$ is _____.

A. 7

B. 12



C. -7

D. -12

Q22 Mathematics

By selling an item at a 10% profit a seller makes a profit of ₹777.70. Find the cost price of the item.

A. ₹7,707

B. ₹7,777



C. ₹7,177

D. ₹7,277

Q23 Mathematics

The value of

$$\{4 - 3 \times [7 - 8 \times (2 \times 4 - 10)]\} =$$

A. -65



B. -25

C. 65

D. 73



Q24 Mathematics

At what rate of per cent per annum will ₹1,300 give ₹520 as simple interest in 5 years?

A. 4%

B. 5%

C. 7%

D. 8%



Q25 Mathematics

The total surface area of a cylinder of radius 70 m and height 140 m, is:

A. $82,500 \text{ m}^2$

B. $92,400 \text{ m}^2$



C. $61,524 \text{ m}^2$

D. 5124 m^2



Mathematics

25 Questions · Answer Key

Q1 Mathematics

The value of $\frac{(4x^2 - 9y^2)^3 + (9y^2 - 49z^2)^3 + (49z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 7z)^3 + (7z - 2x)^3}$ is:

- A. $(2x - 3y)(3y - 7z)(7z - 2x)$
- B. $(2x + 3y)(3y + 7z)(7z + 2x)$ ✓
- C. $42xyz (2x + 3y)(3y + 7z)(7z + 2x)$
- D. $42xyz (2x - 3y)(3y - 7z)(7z - 2x)$

Q2 Mathematics

A cosmetic product is available at 75% discount. If the shopkeeper charges ₹1,874, what is its marked price?

- A. ₹8,342
- B. ₹7,496 ✓
- C. ₹6,145
- D. ₹5,674

Q3 Mathematics

The sum of the digits in a two-digit number is 9. If the value of the number is 6 more than 5 times the digit in the ones' place, then the number is:

- A. 45
- B. 18
- C. 27
- D. 36 ✓

Q4 Mathematics

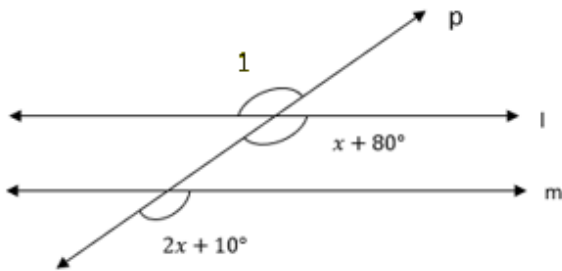
A shopkeeper bought 12 dozen eggs at the rate of ₹5 per egg. 12 eggs broke in transit. He sold the remaining eggs at the rate of ₹6 per egg. Find his percentage of profit.

- A. 5%
- B. 10% ✓
- C. 20%
- D. 15%



Q5 Mathematics

In the given figure line l is parallel to m and p is the transversal. Find the measure of the angle 1.



A. 140°

B. 150° ✓

C. 300°

D. 200°

Q6 Mathematics

Ramesh invested ₹1,232 at 5% p.a. rate of simple interest in a bank. What amount will he get after 3 years?

A. ₹1,848.80

B. ₹1,285.80

C. ₹2,145.80

D. ₹1,416.80 ✓

Q7 Mathematics

Mr. Sharma, Mr. Gupta and Ms Sinha invested ₹4,000, ₹8,000 and ₹6,000, respectively, in a business. Mr. Sharma left after 6 months. If after 8 months, there was a gain of ₹34,000, then what will be the share of Mr. Gupta?

A. ₹12,000

B. ₹14,000

C. ₹16,000 ✓

D. ₹20,000



Q8 Mathematics

If $3^{x-2} + 3^x = 7290$, then the value of x is:

A. 6

B. 7

C. 8



D. 9

Q9 Mathematics

Two pipes A and B can fill a cistern in 36 minutes and 48 minutes, respectively. Both the pipes are opened at the same time and pipe B is closed after some time. If the cistern gets filled in half an hour, then after how many minutes was pipe B closed?

A. 5

B. 8



C. 9

D. 10

Q10 Mathematics

The monthly incomes of two friends Anuj and Mathew, are in the ratio 5 : 7 and each of them saves ₹10,000 every month. If the ratio of their expenditure is 2 : 3, find the income of Anuj.

A. ₹15,000

B. ₹20,000

C. ₹50,000



D. ₹5,000

Q11 Mathematics

The equation $x^2 - 6x + 9 = 0$ can be written as:

A. $(x + 3)^2 = 0$

B. $(x - 2)(x - 3) = 0$

C. $(x - 2)(x - 3)^2 = 0$

D. $(x - 3)^2 = 0$



Q12 Mathematics

A boat starting from point P goes downstream to point Q in 3 hours and returns back from point Q to the point P in 4 hours. If the speed of the water is 3 km/h, find the speed of the boat in still water.

A. 12 km/h

B. 21 km/h



C. 32km/h

D. 20 km/h

Q13 Mathematics

The value of $\frac{1}{(1+\cot^2 x)^2} + \frac{\tan^2 x}{(1+\tan^2 x)^2} + \frac{1}{1+\tan^2 x}$ is:

A. 5

B. 4

C. 3

D. 1

**Q14** Mathematics

If the radius of a sphere is increased by 2 cm, then its surface area increases by 704 cm^2 . Using $\pi = \frac{22}{7}$, find the radius of the sphere before the increase.

A. 13 cm



B. 14 cm

C. 15 cm

D. 16 cm

Q15 Mathematics

The product of two numbers is 1472 and their HCF is 8. Find their LCM.

A. 144

B. 184



C. 108

D. 176



Q16 Mathematics

Hariteja walked to his school at a speed of 4 km/h and returned on a scooter at 20 km/h. His average speed during the two-way journey is:

A. 12 km/h

B. $\frac{20}{3}$ km/h



C. 6 km/h

D. 8 km/h

Q17 Mathematics

The sum of the first 8 prime numbers divided by 7 is equal to _____

A. 11



B. 10

C. 13

D. 14

Q18 Mathematics

Find the value of $7 + \{4 + 3 \text{ of } 4 - (5 + 3 - 6 \div 2)\}$.

A. 18



B. 21

C. 15

D. 17

Q19 Mathematics

Simplify: $\frac{3}{2}x^2 + 2x - \frac{3}{2} + \frac{x^2}{2} - 6x + \frac{1}{2}$.

A. $2x^2 - 4x + 1$

B. $2x^2 - 4x - 1$



C. $2x^2 + 4x - 1$

D. $2x^2 + 4x + 1$



Q20 Mathematics

A and B together complete a work in 8 days. If B is 25% more efficient than A, then in how many days will A alone complete the same work?

A. 12 days

B. 18 days



C. 24 days

D. 6 days

Q21 Mathematics

Which of the following is a quadratic equation whose roots are $\frac{7}{3}$ and $\frac{12}{5}$?

A. $15x^2 - 70x + 84 = 0$

B. $15x^2 - 72x + 84 = 0$

C. $x^2 - 71x + 84 = 0$

D. $15x^2 - 71x + 84 = 0$

**Q22** Mathematics

A cuboidal block, 12 cm by 24 cm by 30 cm, is cut up into an exact number of identical cubes. The least possible number of such cubes is:

A. 55

B. 50

C. 45

D. 40

**Q23** Mathematics

Find the value of $\sqrt{\frac{0.030625}{0.001225}}$.

A. 5



B. 15

C. 25

D. 20



Q24 Mathematics

Which of the following is NOT a property of similar triangles?

- A. Ratio of corresponding sides = Ratio of corresponding perimeters
- B. Ratio of corresponding sides = Ratio of corresponding medians
- C. Ratio of corresponding sides = Ratio of corresponding altitudes
- D. Ratio of any two angles = Ratio of any two medians ✓

Q25 Mathematics

Find x, if the median is 28.5.

CI	0-10	10-20	20-30	30-40	40-50	50-60
F	5	X	20	15	7	5

- A. 2
- B. 4
- C. 8 ✓
- D. 7



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A cyclist covers a distance of 2.5 km in 4 minutes 10 seconds. How long will he take to cover a distance of 6 km at the same speed?

- A. 11 minutes
- B. 10 minutes
- C. 9 minutes
- D. 12 minutes



Q2 Mathematics

The value of $\sqrt{144} + \sqrt{0.0169} - \sqrt{4.41} =$

- A. 10.03
- B. 14.23
- C. 15.4
- D. 11.2



Q3 Mathematics

The average of thirteen consecutive integers is 36. If two times the smallest of these 13 integers is added to the largest of these 13 integers, what will be the sum obtained?

- A. 121
- B. 115
- C. 110
- D. 102



Q4 Mathematics

If $x^2 + xy + x = 18$ and $y^2 + xy + y = 24$, then the value of $x + y$ is:

- A. 5 or -6
- B. 6 or -7
- C. -5 or 6
- D. -6 or 7



Q5 Mathematics

Ten years ago, a mother was 3 times as old as her son. 5 years ago she was $\frac{5}{2}$ times her son's age. What is her present age?

A. 55 years



B. 45 years

C. 35 years

D. 30 years

Q6 Mathematics

If a sum of money doubles itself in 10 years at compound interest, then in how many years will it become 16 times of itself at the same rate?

A. 10

B. 20

C. 30

D. 40



Q7 Mathematics

Which of the following is NOT a true statement?

A. All squares are rhombuses.

B. All sides of a rhombus are congruent.

C. Diagonals of a rhombus bisect each other at right angles.

D. Sum of any pair of adjacent angles of a rhombus is not 180° .



Q8 Mathematics

Solve: $2(5x - 3) + 3(3x - 5) = 93$

A. $x = 6$



B. $x = -6$

C. $x = 9$

D. $x = -9$



Q9 Mathematics

The value of

$$(3^0 + 3^{-2} + 3^{-1}) \times 27 =$$

- A. 23
- B. 32
- C. 39
- D. 3



Q10 Mathematics

In the year 2000, Monu was 3 times his sister's age. In 2010, he was 24 years older than her. Find Monu's age in 2010.

- A. 38 years
- B. 62 years
- C. 52 years
- D. 46 years



Q11 Mathematics

There are three numbers which are co-prime to one other such that the product of the first two is 357 and that of the last two is 609. What is the sum of the three numbers?

- A. 67
- B. 83
- C. 75
- D. 91



Q12 Mathematics

Simplify $\frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A}$.

- A. $\sec A$
- B. $\operatorname{cosec} A$
- C. $2\sec A$
- D. $2\operatorname{cosec} A$



Q13 Mathematics

Find the volume of a sphere whose diameter is 12 cm.

A. $284\pi \text{ cm}^3$

B. $288\pi \text{ cm}^3$ ✓

C. $864\pi \text{ cm}^3$

D. $248\pi \text{ cm}^3$

Q14 Mathematics

The mean of the data 9, 3, 5, 4, 4, 5 and y is y. What is the mode of the data?

A. 4

B. 5 ✓

C. 9

D. 3

Q15 Mathematics

The measure of each interior angle of a regular polygon is 120° . How many sides does this polygon have?

A. 5

B. 6 ✓

C. 7

D. 8

Q16 Mathematics

A bike running at a speed of 50 km/h reaches its destination 10 minutes late. If it runs at 60 km/h it is late by 5 minutes. How many minutes should the bike take, travelling at usual speed to complete the journey on the same route to reach on time?

A. 25 minutes

B. 20 minutes ✓

C. 15 minutes

D. 12 minutes



Q17 Mathematics

The sum of three consecutive multiples of 9 is 2457, find the largest one.

A. 819

B. 828



C. 999

D. 990

Q18 Mathematics

If A bought an item for ₹384 and sold it for ₹576 and B bought another item for ₹1,254 and sold it for ₹1,672. What is the ratio of gain % of A to gain % of B?

A. $\frac{5}{2}$

B. $\frac{3}{4}$

C. $\frac{3}{2}$



D. $\frac{5}{3}$

Q19 Mathematics

The HCF of 45, 78 and 117 is:

A. 7

B. 9

C. 5

D. 3



Q20 Mathematics

The product of the roots of the quadratic equation $6 - 5x^2 - 8x = 0$ is:

A. $\frac{8}{5}$

B. $-\frac{8}{5}$

C. $-\frac{6}{5}$ ✓

D. $\frac{6}{5}$

Q21 Mathematics

A dealer allows 30% discount on the marked price of an item and still makes a profit of 10%. By how much percentage is the marked price more than the cost price (rounded off to two places of decimal)?

A. 26.67%

B. 33.33%

C. 45.45%

D. 57.14% ✓

Q22 Mathematics

The cost incurred by Mahesh to produce an item in the factory was ₹2,000. He had to spend 10% of the production cost incurred on the item in the factory to transport it to the showroom. He sold the item from the showroom at a price that was 15% above the total cost incurred by Mahesh in the production and transportation of the item. What was the price at which Mahesh sold the item from the showroom?

A. ₹2,500

B. ₹2,300

C. ₹2,530 ✓

D. ₹2,250



Q23 Mathematics

A sum of money is to be distributed among four members A, B, C, and D in the ratio 4: 7: 9: 3. If C gets ₹720 more than D, find D's share.

A. ₹160

B. ₹240

C. ₹360



D. ₹480

Q24 Mathematics

Find the area of a rhombus whose diagonals are 12 cm and 15 cm long.

A. 60 cm^2

B. 45 cm^2

C. 80 cm^2

D. 90 cm^2



Q25 Mathematics

The value of $12 \div 3 \times (7 + 8 - 3)$ is:

A. 48



B. $\frac{6}{13}$

C. $\frac{1}{13}$

D. 24



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The value of $4^2 + \sqrt{8^2} - 4\sqrt{25} - 10 =$

A. -6



B. -25

C. -32

D. 12

Q2 Mathematics

If a and b are the roots of the equation $x^2 - 7x + 12 = 0$, then the value of $\frac{a^3 + b^3}{a^2 + b^2 + 1}$ is:

A. 3.5



B. 4.4

C. 5.2

D. 2.6

Q3 Mathematics

If the simple interest on a certain sum for 18 months at 5.5% per annum exceeds the simple interest on the same sum for 14 months at 6% per annum by ₹62.50, then the sum is:

A. ₹8,200

B. ₹7,000

C. ₹6,500

D. ₹5,000



Q4 Mathematics

Rani's sister's age is 4 years more than her age. If her sister's age is 28 years, then find Rani's age.

A. 32 years

B. 26 years

C. 24 years



D. 22 years



Q5 Mathematics

A and B undertake to complete a piece of work for ₹600. A alone can complete it in 4 days while B alone can complete it in 6 days. With the help of C, they finish the work in 2 days. Find the share of C in the payment received.

A. ₹100



B. ₹200

C. ₹300

D. ₹78

Q6 Mathematics

P, Q and R jointly start a business. It was agreed that P would invest ₹25,000 for 6 months, Q ₹44,000 for 5 months and R ₹50,000 for 3 months. Out of total profit of ₹1,04,000, the amount received by P will be:

A. ₹40,920

B. ₹27,900

C. ₹33,780

D. ₹30,000

**Q7 Mathematics**

The sum of the ages of a mother, son and daughter is 70 years. If the mother is thrice as old as her son, and the daughter is 5 years older than her brother, how old is the mother?

A. 35 years

B. 39 years



C. 42 years

D. 45 years

Q8 Mathematics

If the average of 5 consecutive even numbers is 10, then find the number at the centre when these five numbers are arranged in ascending order.

A. 20

B. 14

C. 10



D. 12



Q9 Mathematics

If $48 : x :: x : 75$, and $x > 0$, then what is the value of x ?

A. 60



B. 51

C. 63

D. 57

Q10 Mathematics

If the area of an equilateral triangle is $25\sqrt{3} \text{ cm}^2$, then the length of each side of the triangle is:

A. 5 cm

B. 8 cm

C. 10 cm



D. 12 cm

Q11 Mathematics

If the perimeter of a circle is $\frac{88}{7} \text{ cm}$, then find the perimeter (in cm) of the square the length of each of whose sides is equal to the radius of the given circle. [Use $\pi = \frac{22}{7}$]

A. 6

B. 7

C. 8



D. 9

Q12 Mathematics

If $\tan \theta = 4$, then the value of $\frac{4 \cos \theta + 2 \sin \theta}{2 \sin \theta - \cos \theta}$ is:

A. $\frac{12}{8}$

B. $\frac{12}{7}$



C. $\frac{12}{5}$

D. $\frac{12}{10}$



Q13 Mathematics

A trader marked the price of an article at $1\frac{2}{5}$ times of its cost price and he sold it at $\frac{17}{20}$ of the marked price. What is his gain percentage on that article?

A. 17%

B. 20%

C. 19%



D. 23%

Q14 Mathematics

Find the roots of $\sqrt{2x+9} + x = 13$.

A. 2 and 8

B. 8 and 6

C. 4 and 20

D. 20 and 8



Q15 Mathematics

If the surface area of a sphere is $36\pi \text{ cm}^2$, then the radius of the sphere is:

A. 2 cm

B. 3 cm



C. 4 cm

D. 5 cm

Q16 Mathematics

The value of $\sqrt{29\frac{4}{25}}$ is:

A. 5.5

B. 5.6

C. 5.2

D. 5.4



Q17 Mathematics

If $a^4 + \frac{1}{a^4} = 34$, then the value of $a^6 + \frac{1}{a^6}$ is:

A. 243

B. 216

C. 198



D. 185

Q18 Mathematics

Find the curved surface area of a cylinder whose diameter of base is 14 m and height is 24 m. [Use $\pi = \frac{22}{7}$]

A. 1506 cm^2

B. 1065 cm^2

C. 1056 cm^2



D. 1560 cm^2

Q19 Mathematics

A dishonest dealer professes to sell his goods at the cost price but uses a false weight and thus gains 25%. How much quantity of grains does he give for a kilogram?

A. 900 grams

B. 750 grams

C. 975 grams

D. 800 grams



Q20 Mathematics

If the mean of 22, 25, 27, 24 and x is 26, then the value of x is:

A. 41

B. 35

C. 28

D. 32



Q21 Mathematics

If two parallel lines are intersected by a transversal, then which of the options below is necessarily true?

- A. The sum of the measures of a pair of alternate interior angles is 180°
- B. The sum of the measures of a pair of vertically opposite angles is 180°
- C. The sum of the measures of a pair of interior angles on the same side of the transversal is 180° ✓
- D. The sum of the measures of a pair of corresponding angles is 180°

Q22 Mathematics

The value of $\sqrt{729} + \sqrt{1681} + \sqrt{576} - \sqrt{1849}$ is:

- A. 37
- B. 64
- C. 49 ✓
- D. 55

Q23 Mathematics

Which of the following numbers is divisible by both, 7 and 11?

- A. 1771 ✓
- B. 2684
- C. 2534
- D. 3014

Q24 Mathematics

A person has to cover a distance of 8 km in 1 hour. If he covers one-fourth of the distance in one-third of the total time, then what should his speed (in km/h) be to cover the remaining distance in the remaining time so that the person reaches the destination exactly on time?

- A. 9 ✓
- B. 8
- C. 7
- D. 6



The total number of three-digit numbers divisible by 2 or 5 is

A. 400

B. 540



C. 245

D. 270



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Madhu and Shiney together can complete a piece of work in 20 days, Shiney and Rosy together can complete the same work in 12 days, and Rosy and Madhu together can complete the work in 15 days. In how many days will three of them complete it together?

- A. 5 days
- B. 10 days
- C. 12 days
- D. 15 days



Q2 Mathematics

In a parallelogram two adjacent sides are in the ratio 3 : 2 and the perimeter is 65 cm. The length of each of the two shorter sides of this parallelogram is:

- A. 18 cm
- B. 19 cm
- C. 13 cm
- D. 21 cm



Q3 Mathematics

$16x^2 - 8x + 1 = 0$, then what is the value of $(16x^2 + \frac{1}{4x^2})$?

- A. 4
- B. 5
- C. 6
- D. 7



Q4 Mathematics

Find the selling price of an article (in ₹) if the cost price is ₹4,500 and gain is 5%.

A. 4,725



B. 4,675

C. 4,527

D. 4,657

Q5 Mathematics

Select the correct option with respect to the following.

Two triangles are similar if:

- a) Any two of their sides are equal
- b) their corresponding sides are proportional
- c) Any two of their angles are equal
- d) their corresponding angles are equal

A. both a and b

B. both b and c

C. both a and d

D. both b and d



Q6 Mathematics

If $2^{3k-5} = 4096$, then the value of k is:

A. 7

B. $\frac{17}{3}$



C. $\frac{16}{3}$

D. 11



Q7 Mathematics

Find the arithmetic mean of 5, 15, 23, 26, and 29.

A. 20.6

B. 19.6



C. 18.6

D. 17.6

Q8 Mathematics

If $a + b + c = 6$ and $ab + bc + ca = -2$, then find the value of $a^3 + b^3 + c^3 - 3abc$.

A. 240

B. 200

C. 252



D. 192

Q9 Mathematics

If $x + \frac{1}{x} = 4$, then $x^2 + \frac{1}{x^2} =$

A. 18

B. 16

C. 14



D. 12

Q10 Mathematics

A tank is filled in 4 hours by three pipes A, B and C. Pipe C is twice as fast as pipe B and pipe B is twice as fast as pipe A. How much time will pipe A take to fill the tank?

A. 20 hours

B. 25 hours

C. 26 hours

D. 28 hours



Q11 Mathematics

Find the roots of the equation $x^2 + 11x - 26 = 0$.

- A. 11 and 2
- B. -2 and 11
- C. -13 and 2
- D. 13 and -2



Q12 Mathematics

If $18 : 30 :: 30 : x$, then find the value of x .

- A. 50
- B. 40
- C. 35
- D. 45



Q13 Mathematics

Which of the following is a quadratic equation?

- A. $x(x - 4) = 2x + x^2 - 7$
- B. $5(2y + 3) - 6y = 5y(y^2 - 8y)$
- C. $k(k + 1) - k(k - 2) 2k = 0$
- D. $p(p^2 + 7) = p^2 + p^3 - 18$

- A. Only A
- B. Only B
- C. Only C
- D. Only D



Q14 Mathematics

What is the least number added to 2488 so that it is completely divisible by 3,4,5 and 6?

A. 42

B. 28

C. 34

D. 32



Q15 Mathematics

Simplify $4\frac{7}{9} \times 7\frac{8}{9} \times 81 + 2\frac{3}{4}$.

A. 3055.25

B. 3053.25

C. 3053.75

D. 3055.75



Q16 Mathematics

Rajiv's salary was first decreased by 40% and subsequently increased by 50%. How much percent did he lose from his initial salary?

A. 10%

B. 15%

C. 12%

D. 14%



Q17 Mathematics

Evaluate. $\left(\frac{-2}{5}\right)^{-2} \times \left(\frac{-4}{5}\right)^4$

A. $\frac{64}{25}$

B. $\frac{25}{64}$

C. $\frac{25}{26}$

D. $\frac{26}{25}$



Q18 Mathematics

Find the length of the side of an equilateral triangle, if its area is $4\sqrt{3}$ sq. unit.

- A. $\sqrt{3}$ unit
- B. 16 unit
- C. 2 unit
- D. 4 unit



Q19 Mathematics

The value of the product

$\sin 90^\circ \cdot \sin 89^\circ \cdot \sin 88^\circ \cdot \sin 87^\circ \dots \sin 0^\circ$ is:

- A. 1
- B. π
- C. $\frac{\pi}{2}$
- D. 0



Q20 Mathematics

The odometer of a car reads 12,000 km at the start of a trip and 12,800 km at its end. If the trip took 4 hours, then the average speed of car in m/sec is:

- A. $\frac{430}{8} \text{ m/sec}$
- B. $\frac{188}{9} \text{ m/sec}$
- C. $\frac{270}{8} \text{ m/sec}$
- D. $\frac{500}{9} \text{ m/sec}$



Q21 Mathematics

A sum of money amounts to ₹13,380 after 3 years and to ₹20,070 after 6 years at compound interest compounded annually. Find the sum.

- A. ₹8,920
- B. ₹7,020
- C. ₹8,505
- D. ₹7,007



Q22 Mathematics

A shopkeeper sells 35 kg sugar for every 40 kg using false weights. How much percentage profit does he make if sells sugar at cost price (rounded off to two places of decimal)?

A. 17.66%

B. 15.33%

C. 14.28% ☒

D. 12.50%

Q23 Mathematics

A cuboidal room is of length 15 m, breadth 17 m, and height 21 m. Find the cost of painting its walls and ceiling at the rate of ₹40/m².

A. ₹44,250

B. ₹85,126

C. ₹58,912

D. ₹63,960 ☒**Q24** Mathematics

What is the greatest number, by which when 8954, 9806 and 11297 are divided, the remainder in each case is the same?

A. 230

B. 222

C. 125

D. 213 ☒**Q25** Mathematics

Simplify: $x^2 + 5x - 12 - 3(x^2 - 2x + 9)$.

A. $-2x^2 + 11x - 39$ ☒B. $2x^2 + 11x - 39$ C. $-2x^2 + 11x + 39$ D. $2x^2 - 11x - 39$ 

Mathematics

25 Questions • Answer Key

Q1 Mathematics

Chandrasekhar sold 12 identical articles for a total of ₹420, incurring a loss equal to the cost price of 7 such articles. The cost price of 1 such article is:

A. ₹60

B. ₹48

C. ₹84



D. ₹35

Q2 Mathematics

Which of the following is the correct empirical formula?

A. $3(\text{mode} - \text{mean}) = \text{median} - \text{mean}$ B. $\frac{2}{3}(\text{Mode} - \text{Mean}) = \text{Median} - \text{Mean}$ C. $\frac{\text{Mode} - \text{Mean}}{3 \times 2} = \text{Median} - \text{Mean}$ D. $\frac{\text{Mode} - \text{Mean}}{3} = \text{Median} - \text{Mean}$ 

Q3 Mathematics

The LCM of two numbers is 84. If the numbers are in the ratio 2: 3, then find the sum of the numbers.

A. 25

B. 40

C. 60

D. 70



Q4 Mathematics

If the simple interest on a sum of money at 8% per annum for 2 years is ₹1,000, find the compound interest on the same sum for the same period at the same rate in case of annual compounding.

A. ₹1,040



B. ₹1,140

C. ₹1,060

D. ₹1,260



Q5 Mathematics

Simplify $\frac{423 \times 423 - 325 \times 325}{423 - 325}$.

A. 478

B. 874

C. 748



D. 487

Q6 Mathematics

The value of

$$12 + 12 \times 12 - 12 \div 12 =$$

A. 23

B. 0

C. 155



D. 140

Q7 Mathematics

Which of the following is RHS of the equation

$$\sqrt{\frac{1+\sin A}{1-\sin A}} =$$

A. $\sec A + \cot A$

B. $\sin A + \cos A$

C. $\sec A + \tan A$



D. $\frac{1}{\operatorname{cosec} A}$

Q8 Mathematics

Find the greatest 5-digit number that can be divisible by 18, 15 and 21.

A. 99545

B. 99455

C. 99450

D. 99540



Q9 Mathematics

When the selling price of a TV is ₹18,700, the shopkeeper incurred a loss of 15%. What should be the selling price of that TV to gain 15%?

- A. ₹34,200
- B. ₹19,800
- C. ₹43,200
- D. ₹25,300

**Q10** Mathematics

6 men and 8 women could finish a work in 14 days. 8 men and 12 women could finish the same work in 10 days. How much time would be taken to finish the same work if one man worked alone?

- A. 140 days
- B. 175 days
- C. 210 days
- D. 280 days

**Q11** Mathematics

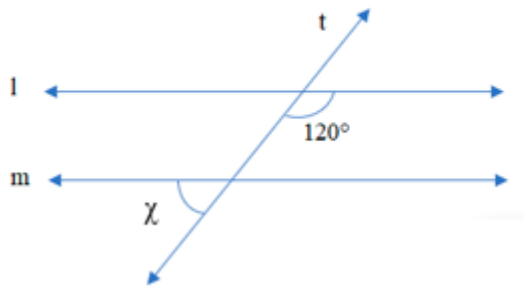
Using $\pi = \frac{22}{7}$, find the perimeter of the semi-circle whose diameter is 21 cm long.

- A. 64.5 cm
- B. 72.5 cm
- C. 54.0 cm
- D. 77.5 cm



Q12 Mathematics

If the given figure line l is parallel to m and t is the transversal. Find the measure of angle x .



A. 120°

B. 60°



C. 30°

D. 40°

Q13 Mathematics

Simplify:

$$(x^2 + m^2 - z^2)^2 - (x^2 - m^2 + z^2)^2 =$$

A. $4x(m^2 - z^2)$

B. $3x^2(m^2 - z^2)$

C. $4x^2(m^2 - z^2)$



D. $2x^2(m^2 - z^2)$

Q14 Mathematics

1500 people visited an exhibition on Saturday, while 1680 visited on Sunday. The percentage increase in the number of people visiting the exhibition is _____.

A. 10%

B. 12%



C. 13%

D. 18%



Q15 Mathematics

There are two consecutive natural numbers such that the sum of their squares is 313. Find the smaller of these two numbers.

A. 12



B. 13

C. 14

D. 15

Q16 Mathematics

Find the median of:

CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70
F	2	4	7	9	10	12	6

A. 40

B. 41

C. 42

D. 43

**Q17** Mathematics

Find the area of the parallelogram whose base is 15 cm and the corresponding height is 6 cm.

A. 60 cm^2

B. 45 cm^2

C. 90 cm^2



D. 80 cm^2

Q18 Mathematics

8 men and 12 women can build a wall in 10 days. 6 men and 8 women can build the same in 14 days. How long will take 1 woman to build it alone?

A. 350 days

B. 700 days

C. 140 days

D. 280 days



Q19 Mathematics

A can complete a certain job in 32 days. B is 60% more efficient than A. In how many days can B alone complete the same job?

- A. 10 days
- B. 15 days
- C. 20 days
- D. 32 days



Q20 Mathematics

If, in the quadrilateral ABCD, the measures of the angles A, B, C, and D are in the ratio 2 : 3 : 5 : 6, then the quadrilateral is a:

- A. square
- B. Kite
- C. parallelogram
- D. trapezium



Q21 Mathematics

The third proportional of 10 and 50 is

- A. 250
- B. 125
- C. 1250
- D. 300



Q22 Mathematics

Simplify:

$$\frac{4.32 \times 4.32 - 2.64 \times 2.64}{1.68}$$

- A. 6.94
- B. 6.96
- C. 6.99
- D. 6.56



Q23 Mathematics

A, B and C can do a piece of work in 20, 30 and 60 days, respectively. In how many days can A complete the work if he is assisted by B and C on every third day?

A. 13 days

B. 24 days

C. 12 days

D. 15 days **Q24** Mathematics

Express $0.2\bar{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{5}{18}$ B. $\frac{18}{5}$ C. $\frac{7}{18}$ D. $\frac{18}{7}$ **Q25** Mathematics

Find the roots of $3a^2x^2 + 8abx + 4b^2 = 0$

A. $-\frac{2b}{a}$ and $-\frac{2b}{a}$ B. $-\frac{2b}{a}$ and $-\frac{2b}{3a}$ C. $-\frac{2b}{a}$ and $-\frac{3b}{2a}$ D. $-\frac{2b}{3a}$ and $-2b$ 

Mathematics

25 Questions • Answer Key

Q1 Mathematics

Arrange the given fractions in ascending order: $\frac{1}{3}, \frac{4}{7}, \frac{2}{5}, \frac{5}{6}, \frac{3}{5}$

A. $\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{4}{7}, \frac{5}{6}$

B. $\frac{5}{6}, \frac{1}{3}, \frac{4}{7}, \frac{2}{5}, \frac{3}{5}$

C. $\frac{1}{3}, \frac{2}{5}, \frac{4}{7}, \frac{3}{5}, \frac{5}{6}$ ✓

D. $\frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{4}{7}, \frac{5}{6}$

Q2 Mathematics

The traffic lights at three different crossings turn red after every 30 sec, 45 sec, and 60 sec, respectively. If they all turn red simultaneously at 8.30 a.m., then at what time will they again turn red simultaneously?

A. 8.33 a.m. ✓

B. 8.34 a.m.

C. 8.35 a.m.

D. 8.38 a.m.

Q3 Mathematics

A fraction becomes $\frac{1}{2}$ if 2 is added to the numerator and 5 is added to the denominator. It also becomes $\frac{1}{3}$ if 2 is subtracted from both the numerator and denominator. Then the fraction is

A. $\frac{8}{15}$

B. $\frac{3}{5}$ ✓

C. $\frac{1}{7}$

D. $\frac{4}{17}$



Q4 Mathematics

A parallelogram having all sides equal and diagonals unequal is called a:

- A. square
- B. rectangle
- C. rhombus
- D. kite



Q5 Mathematics

Find the cost of fencing of a rectangular land, if it has an area of 100 m^2 and one side of length 20 m at a rate of ₹30 per meter.

- A. ₹2,400
- B. ₹1,500
- C. ₹3,000
- D. ₹1,200



Q6 Mathematics

If $\frac{a+1}{a} = k$, what is the value of $\frac{a^2-1}{a^2}$?

- A. $k^2 + 2$
- B. $k - 2k^2$
- C. $2k - k^2$
- D. $k + 2$



Q7 Mathematics

The LCM of $2^3 \times 3^2 \times 5$, $2^2 \times 5^2 \times 7$ and $3^3 \times 5^2 \times 7^2$ is:

- A. $2^3 \times 3^2 \times 5^3 \times 7^2$
- B. $2^3 \times 3^2 \times 5 \times 7^3$
- C. $2^3 \times 3^3 \times 5^2 \times 7^2$
- D. $2^3 \times 3^4 \times 5^2 \times 7$



Q8 Mathematics

If $\triangle ABC$ is similar to $\triangle DEF$ such that $2AB = DE$ and $BC = 8$ cm, then EF is equal to:

- A. 12 cm
- B. 4 cm
- C. 16 cm
- D. 8 cm



Q9 Mathematics

The ratio of the present ages of a man and his wife is $7 : 6$. After 6 years, this ratio will be $8 : 7$. If, at the time of marriage, the ratio of their ages was $4 : 3$, then how many years ago from now did they get married?

- A. 13 years
- B. 15 years
- C. 16 years
- D. 18 years



Q10 Mathematics

A batsman scored the following runs in the last 5 innings. Find his score in the 4th innings if the average score is 43.

1 st	2 nd	3 rd	4 th	5 th
92	53	35	x	27

- A. 8
- B. 12
- C. 10
- D. 4



Q11 Mathematics

Find the fourth proportional of $x + 7x$, $x + 5$ and $x + 6$ if $x = 3$.

- A. 24
- B. 8
- C. 9
- D. 3



Q12 Mathematics

Twelve years ago, Rekha's age was $\frac{2}{5}$ of that of her sister. The ratio of Rekha's and her sister's present age is 3: 4. What is the total of their present ages?

A. 36 years



B. 28 years

C. 48 years

D. 42 years

Q13 Mathematics

Two trains start at the same time from Stations A and B respectively and travel towards each other at a speed of 60 km/h and 40 km/h, respectively. At the time they meet, the faster train has travelled 60 km more than the slower train. What is the distance between the two stations?

A. 300 km



B. 360 km

C. 420 km

D. 450 km

Q14 Mathematics

Two express trains of length 320 m and 380 m started moving from Ahmedabad to Delhi at the same time. Their speeds are 84 km/h and 42 km/h, respectively. In how many seconds will the faster train cross the slower train?

A. 45 sec

B. 50 sec

C. 120 sec

D. 60 sec

**Q15** Mathematics

Mr. Saxena bought some pens at ₹150 a dozen. He sold them for ₹15 each. What is his profit/loss per cent?

A. 20% profit



B. 37.5% loss

C. 28.6% loss

D. 18.5% profit



Q16 Mathematics

If $1 + \sqrt{3}$ and $1 - \sqrt{3}$ are the roots of a quadratic equation, then the quadratic equation is:

A. $x^2 - 2x - 2 = 0$ ✓

B. $x^2 - 2x + 2 = 0$

C. $x^2 - 2x + 3 = 0$

D. $x^2 - 2x - 3 = 0$

Q17 Mathematics

The sum of roots of the equation $5x^2 - 11x + 6 = 0$ is:

A. $\frac{6}{5}$

B. $-\frac{6}{5}$

C. $-\frac{11}{5}$

D. $\frac{11}{5}$ ✓

Q18 Mathematics

Simplify: $\left(\frac{2}{3} + \frac{1}{3}\right) \times 23 - 13 + 6$.

A. 16 ✓

B. 10

C. 23

D. 29

Q19 Mathematics

Find the area of a regular hexagon (in cm^2) with sides of length 6 cm.

A. $5\sqrt{2}$

B. 18

C. $54\sqrt{3}$ ✓

D. 36



Q20 Mathematics

The fourth proportion of 12, 24 and 45 is:

A. 25

B. 30

C. 90



D. 60

Q21 Mathematics

If $\frac{a}{b} = \frac{4}{3}$ and $3a + 2b = 24$, then find the value of a.

A. 4

B. 5

C. $\frac{13}{3}$

D. $\frac{16}{3}$



Q22 Mathematics

The simple interest on a sum of money is $\frac{3}{5}$ of the principal in 12 years. What is the rate of interest per annum?

A. 5%



B. 6%

C. 7%

D. 8%

Q23 Mathematics

The cost price of an article is 64% of the marked price. Calculate the gain percent after allowing a discount of 4%.

A. 50%



B. 60%

C. 40%

D. 45%



Q24 Mathematics

If mean of the data 11, 17, $x + 1$, $3x$, 19, $2x - 4$, $x + 5$ is 21, then find the mode of the data.

A. 11

B. 15

C. 17

D. 19



Q25 Mathematics

Simplify: $\sqrt{\frac{1+\sin \theta}{1-\sin \theta}}$.

A. $\sec \theta - \tan \theta$

B. $\operatorname{cosec} \theta + \tan \theta$

C. $\operatorname{cosec} \theta - \tan \theta$

D. $\sec \theta + \tan \theta$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Rachna can eat 21 oranges in 60 minutes. She wants to know how many minutes it would take her to eat 35 oranges at the same pace?

- A. 80 min
- B. 90 min
- C. 100 min
- D. 120 min



Q2 Mathematics

Two pipes, A and B, can fill a tank of 1000 litres in 5 hours and 6 hours, respectively. If they are opened together, how many hours will they take to fill an empty tank of 1800 litres?

- A. $\frac{54}{11}$
- B. $\frac{52}{11}$
- C. $\frac{25}{11}$
- D. $\frac{45}{11}$



Q3 Mathematics

Simplify $\sqrt{625} - \sqrt{324} + 33^2$.

- A. 1069
- B. 1609
- C. 1906
- D. 1096



Q4 Mathematics

The value of $\sqrt{1234321} =$

- A. 121
- B. 139
- C. 1111
- D. 1219



Q5 Mathematics

What is the measure of each exterior angle of a regular hexagon?

- A. 60°
- B. 30°
- C. 45°
- D. 120°



Q6 Mathematics

The coefficient of x^4y^3 in the expansion of $(3x - 2y)^2(x^2 + y^3)^2$ is:

- A. 18
- B. 15
- C. 12
- D. 14



Q7 Mathematics HINDI - no English version saved

एक फल विक्रेता ₹4,800 में 800 सेब खरीदता है। वह परिवहन पर ₹800 खर्च करता है। उसे प्रत्येक सेब पर ₹10 का लाभ प्राप्त करने के लिए, प्रत्येक सेब को किस मूल्य पर बेचना चाहिए?

- A. ₹76
- B. ₹32
- C. ₹12
- D. ₹17



Q8 Mathematics

If $x : 6 :: 6 : y$, and $x : y :: y : 6$, then which of the options below gives the correct values of x and y , in that order?

A. 6 and 6



B. 6 and 12

C. 12 and 6

D. 12 and 12

Q9 Mathematics

If the mean of the following data is 4, find the missing frequency.

x	3	5	9	2
f	3	4	-	8

A. 4

B. 5

C. 3



D. 7

Q10 Mathematics

The value of $156.025 + 251.216 - 52.156$ is:

A. 355.085



B. 302.152

C. 326.327

D. 332.074

Q11 Mathematics

If the average of two numbers is 26 and one of them is 12, then find the other number.

A. 14

B. 20

C. 40



D. 52



Q12 Mathematics HINDI - no English version saved

एक पिता की आयु, उसके पुत्र की आयु की सात गुनी है। अब से तीन वर्ष बाद, पिता की आयु उसके पुत्र की आयु की पांच गुनी हो जाएगी। पिता की वर्तमान आयु कितनी है?

A. 45 वर्ष

B. 42 वर्ष



C. 39 वर्ष

D. 36 वर्ष

Q13 Mathematics

The floor of an office has dimensions $5\text{ m} \times 3\text{ m}$. The cost of painting the walls and ceiling is ₹7,440 at the rate of ₹60/m². Find the height of the room (in m).(rounded off to one decimal place)

A. 6.8



B. 4.5

C. 5.6

D. 3.5

Q14 Mathematics

8118 is divisible by:

A. 5

B. 6



C. 7

D. 8

Q15 Mathematics

A dealer sold three-fifth of his goods at a gain of 25% and the remaining at cost price. What is his loss or gain percent in the whole transaction?

A. 18% loss

B. 18% gain

C. 15% loss

D. 15% gain



Q16 Mathematics

Find the arithmetic mean of the given data.

x	10	20	30	40	50
f	5	5	4	6	5

A. 30.4



B. 30.6

C. 26.4

D. 16.4

Q17 Mathematics

The number of solutions to the pair of linear equations $5x - 3y = 7$ and $7x + 4y = 18$ is:

A. one



B. none

C. infinite

D. three

Q18 Mathematics

If one root of the equation $(a + 3)x^2 - 13ax + 7 - a = 0$ is the reciprocal of the other, then the value of a is:

A. -2

B. -3

C. 2



D. 3

Q19 Mathematics HINDI - no English version saved

यदि 2 वर्ष पहले रवि ने मोनू से 4% वार्षिक चक्रवृद्धि ब्याज की दर पर ₹3,000 की राशि उधार ली थी, तो उसे चुकाने के लिए रवि द्वारा मोनू को कुल कितनी राशि का भुगतान करना होगा?

A. ₹2,344.80

B. ₹3,453.90

C. ₹3,244.80



D. ₹4,321



Q20 Mathematics

Find the least six-digit number that is exactly divisible by 8, 10, 12 and 16.

- A. 100020
- B. 100040
- C. 100060
- D. 100080



Q21 Mathematics

Find the total surface area of a cylinder whose radius of base is 7 cm and height is 15 cm.

- A. $308\pi \text{ cm}^2$
- B. $380\pi \text{ cm}^2$
- C. $803\pi \text{ cm}^2$
- D. $830\pi \text{ cm}^2$



Q22 Mathematics

Which of the following is NOT a quadrilateral?

- A. Parallelogram
- B. Rhombus
- C. Circle
- D. Trapezium



Q23 Mathematics

Find the value of $\frac{\sin^2 \theta - \sin^4 \theta + 1}{1 - \sin^2 \theta} + \frac{1 - \tan^2 \theta - \tan^4 \theta}{1 + \tan^2 \theta}$.

- A. -1
- B. 0
- C. 1
- D. 2



Q24 Mathematics

For what values of z will the following equation have equal roots?

$$(z + 4)x^2 + (z + 1)x + 1 = 0$$

A. 4, 3

B. 2, -5

C. 5, -3



D. 2, -3

Q25 Mathematics

Two pipes A and B can fill a tank in 15 hours and 20 hours, respectively, while a third pipe C can empty the full tank in 30 hours. If all the three pipes operate simultaneously, in how much time will the tank, initially empty, be filled?

A. 12 hours



B. 13 hours

C. 15 hours

D. 18 hours



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Ten years ago, a son was $\frac{1}{8}$ th of his father's age. Now, he is $\frac{9}{37}$ th of his father's present age. Find the present age of the father.

- A. 87 years
- B. 67 years
- C. 74 years
- D. 57 years



Q2 Mathematics

If p, q, r and s, the measures of the four angles of a quadrilateral, are in the ratio 3 : 5 : 4 : 6, then the value of 3p + 2r is:

- A. 340°
- B. 360°
- C. 330°
- D. 310°



Q3 Mathematics

A pair of parallel lines is intersected by a transversal such that $\angle 1$ and $\angle 2$ form a pair of interior angles on the same side of the transversal. If $m\angle 1 = 35^\circ$, what is the measure of $\angle 2$?

- A. 145°
- B. 55°
- C. 35°
- D. 65°



Q4 Mathematics

If the mean of a data is 65 and its mode is 23 then the median using empirical formula is:

- A. 52
- B. 51
- C. 53
- D. 54



Q5 Mathematics

A tradesman marked his goods at 26% above its cost price and then allowed a discount of 13%. His gain (in %) is:

A. 9.62



B. 9.26

C. 6.92

D. 6.29

Q6 Mathematics

Simplify:

$$a^2 + 9b^2 + c^2 - 6ab + 6bc - 2ac =$$

A. $(a - 3b + c)^2$

B. $(a + 3b + c)^2$

C. $(a - 3b - c)^2$



D. $(a - 3b - 2c)^2$

Q7 Mathematics

Mohan gets 12% increase in his sale amount in the first year and 15% increase in the second year, with that his present sale is ₹1,28,800, what was his sale two years ago?

A. ₹1,00,000



B. ₹1,50,000

C. ₹1,75,000

D. ₹1,25,000

Q8 Mathematics

A shopkeeper allows successive discount of 20% and 15% on an item of marked price ₹2,000. At what price did he sell the item?

A. ₹1,300

B. ₹1,200

C. ₹1,240

D. ₹1,360



Q9 Mathematics

The value of $1 + 3 + 5 + 7 + \dots + 21 =$

A. 108

B. 211

C. 121



D. 144

Q10 Mathematics

The smallest whole number that must be multiplied to 1083 to make it a perfect square, is:

A. 4

B. 3



C. 2

D. 11

Q11 Mathematics

One year ago, Krishna was four times as old as his daughter Kavitha. Six years hence, Krishna's age will be 12 years more than his daughter's age. Find the ratio of the present ages of Krishna and his daughter.

A. 9:2

B. 11:3

C. 12:5

D. 17:5



Q12 Mathematics

What is the least 5-digit number, which when divided by 15, 24, 35 and 42, the remainder in each case is 13?

A. 10067

B. 10093



C. 10073

D. 10106



Q13 Mathematics

Two banks, A and B, offered loans at 4.5% and 5.5% per annum, respectively. Ramesh borrowed an amount of ₹2,00,000 from each bank. Find the positive difference in the amounts of simple interest paid to the two banks by Ramesh after 2 years.

A. ₹ 8,000

B. ₹ 6,000

C. ₹ 2,000

D. ₹ 4,000 ☒**Q14** Mathematics

If $x : y = 7 : 3$, then $(x^2 + y^2) : (x^2 - y^2) = ?$

A. 5 : 2

B. 29 : 20 ☒

C. 5 : 1

D. 25 : 4

Q15 Mathematics

If A is an acute angle of triangle ABC, the $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1}$ is equal to:

A. $\cot A + \operatorname{cosec} A$ ☒B. $\cos A + \operatorname{cosec} A$ C. $\cot A + \sec A$ D. $\tan A + \cos A$ **Q16** Mathematics

A cube made of edge 18 m is completely filled with milk. The milk is transferred into a cuboid of length 27 m and height 7 m. The width of the cuboid is

A. 72.5 m

B. 54.6 m

C. 12.7 m

D. 30.8 m ☒

Q17 Mathematics

Two trains of same length are running on parallel tracks in the same direction at speeds of 56 m/s and 46 m/s. The faster train crosses the slower train in 26 sec. The length of each train is:

A. 100 m

B. 120 m

C. 140 m

D. 130 m ☒**Q18** Mathematics

Find the surface area of a sphere whose radius is 7 cm. [Use $\pi = \frac{22}{7}$]

A. 166 cm^2 B. 661 cm^2 C. 666 cm^2 D. 616 cm^2 ☒**Q19** Mathematics

The value of $\frac{2}{3} + \frac{1}{1+\frac{4}{5}} - \frac{5}{6}$ is:

A. $\frac{13}{18}$ B. $\frac{7}{18}$ ☒C. $\frac{11}{18}$ D. $\frac{5}{18}$ **Q20** Mathematics

Five-fourths of a number is greater than three-fourths of the number by 6. Find the number.

A. 8

B. 10

C. 12 ☒

D. 14



Q21 Mathematics

Pipe A is 3 times faster than pipe B. Both pipes together fill a tank in 36 min. How much time will pipe A alone take to fill the tank?

- A. 80 min
- B. 100 min
- C. 48 min
- D. 156 min

**Q22** Mathematics

The sum of two positive integers is 55. If their HCF and LCM are 5 and 120, respectively, then the sum of their reciprocals is _____.

- A. $\frac{12}{13}$
- B. $\frac{120}{13}$
- C. $\frac{11}{120}$
- D. $\frac{14}{6}$

**Q23** Mathematics

If one root of a quadratic equation, α , is half of the other root of the same equation, then find the quadratic equation.

- A. $x^2 - 3\alpha x + 2\alpha^2 = 0$
- B. $x^2 + 3\alpha x + 2\alpha^2 = 0$
- C. $x^2 - 3\alpha x - 2\alpha^2 = 0$
- D. $x^2 + 3\alpha x - 2\alpha^2 = 0$

**Q24** Mathematics

Find the roots of $\sqrt{3}m^2 + 10m + 7\sqrt{3} = 0$.

- A. $-\frac{7}{\sqrt{3}}$ and $-\sqrt{3}$
- B. $-\frac{7}{\sqrt{3}}$ and $\sqrt{3}$
- C. $\frac{7}{\sqrt{3}}$ and $-\sqrt{3}$
- D. $-\frac{7}{\sqrt{3}}$ and $-2\sqrt{3}$



Q25 Mathematics

The frequency distribution here gives the monthly consumption of electricity of 60 consumers of a locality. What is the median of the data?

Monthly consumption (in units)	Number of consumers
50 – 60	6
60 – 70	8
70 – 80	15
80 – 90	20
90 – 100	11

A. 80.5



B. 81.2

C. 82.4

D. 83.1



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Which of the following is the quadratic equation whose roots are -2 and 4 ?

A. $2x^2 - 6x - 24 = 0$

B. $3x^2 - 5x - 24 = 0$

C. $3x^2 - 6x - 24 = 0$ ✓

D. $3x^2 - 6x - 20 = 0$

Q2 Mathematics

The ratio of the sum of all the interior angles to an exterior angle of a regular polygon is $24:1$. Find the number of sides of the polygon.

A. 80

B. 78

C. 10

D. 8 ✓

Q3 Mathematics

There are four prime numbers taken in ascending order. The product of the first three prime numbers is 1771 and the sum of the last two prime numbers is 82. What is the product of the last two prime numbers?

A. 1357 ✓

B. 1537

C. 1127

D. 1387

Q4 Mathematics

A train is moving in from north to south direction. It overtakes Raj and Madhur who are walking in the same direction at the rate of 2 km/h and 4 km/h in 9 sec and 10 sec, respectively. If the train is x metres long, find the value of x .

A. 90

B. 70

C. 50 ✓

D. 30



Q5 Mathematics

In how much time will a sum of money double itself at 10 per cent per annum rate of simple interest?

A. 10 years



B. 8 years

C. 12 years

D. 5 years

Q6 Mathematics

The value of $-48 \div [4 \times (6 - 5 + 1)] \div 24 =$

A. 12

B. -9

C. $-\frac{7}{4}$

D. $-\frac{1}{4}$



Q7 Mathematics

Simplify $\sqrt{729} - \sqrt{400}$.

A. 5

B. 6

C. 7



D. 8

Q8 Mathematics

The average age of Raj and his sister is 8 years. If Raj's age is 10 years, then find the age of his sister.

A. 8 years

B. 7 years

C. 6 years



D. 9 years



Q9 Mathematics

Find the fourth proportional of $4a + 7$, $11a + 3$ and $6a$, if $a = 2$.

A. 15

B. 20

C. 25

D. 30

Q10 Mathematics

Simplify:

$$(1.5a^2 - 2.5b^2)(1.5a^2 + 2.5b^2) + 6.25ab$$

A. $2.25a^4 - 6.25b^4 + 6.25ab$

B. $2.5a^4 - 6.25b^4 + 6.25ab$

C. $2.25a^4 - 6.5b^4 + 6.25ab$

D. $2.25a^4 - 6.25b^4$

Q11 Mathematics

If the selling price of an almirah is doubled, profit is tripled. Find the profit percentage.

A. 10%

B. 25%

C. 50%

D. 100%

Q12 Mathematics

An amount is divided between two friends in the ratio $2 : 5$. If the second part is ₹6 more than the first, then the initial amount is:

A. ₹12

B. ₹14

C. ₹13

D. ₹23



Q13 Mathematics

A 250-metre long train running at a speed of 100 km/h crosses another train coming from the opposite direction at a speed of 62 km/h in 10 seconds. What is the length of the second train?

A. 230 metres

B. 200 metres



C. 270 metres

D. 240 metres

Q14 Mathematics

The angles of a quadrilateral are in the ratio 2: 5: 7: 10. Find the difference between the greatest and the smallest angles of the quadrilateral.

A. 60°

B. 50°

C. 120°



D. 180°

Q15 Mathematics

If a and b are the roots of $x^2 - x - 12 = 0$, and $a > b$, then the quadratic equation in x whose roots are $(2a - 1)$ and $(2b + 1)$ is:

A. $x^2 - 2x + 35 = 0$

B. $x^2 - 2x - 35 = 0$



C. $x^2 - 4x - 45 = 0$

D. $x^2 - 4x + 45 = 0$

Q16 Mathematics

Simplify: $(1 + \tan^2 \theta)(1 - \sin \theta)(1 + \sin \theta)$.

A. -1

B. 0

C. 1



D. 2



Q17 Mathematics

Find the third proportional of 18 and 54.

A. 121

B. 144

C. 162



D. 172

Q18 Mathematics

In Munnar, a travel company has three 4-seater cars and two 8-seater maxi cabs. The rate of each passenger for a round trip in a car is ₹25 and for a round trip in a maxi cab is ₹20. The average occupancy of the seats is 100%. What is the average earning of each vehicle for one round trip?

A. ₹127

B. ₹126

C. ₹125

D. ₹124

**Q19** Mathematics

Find the double of the lower limit of the modal class in the given data.

CI	100-110	110-120	120-130	130-140	140-150
F	12	15	32	34	22

A. 280

B. 68

C. 260



D. 540

Q20 Mathematics

How many cylinders of radius 10 cm and height 20 cm can be filled with water from a cylinder of radius 20 cm and height 100 cm full of water?

A. 20



B. 30

C. 40

D. 60



Q21 Mathematics

The difference between two numbers is 42 and they are in the ratio 5 : 3. Find the smaller number.

A. 105

B. 36

C. 63



D. 21

Q22 Mathematics

If a man bought 6 pencils for ₹5, and sold them at 5 pencils for ₹6, then the gain percentage is _____

A. 44%



B. 43%

C. 42%

D. 41%

Q23 Mathematics

Convert $0.2\overline{36}$ into a vulgar fraction.

A. $\frac{17}{66}$ B. $\frac{13}{55}$ C. $\frac{9}{44}$ D. $\frac{7}{33}$ **Q24** Mathematics

Which of the following pairs of numbers is co-prime?

A. (14, 21)

B. (17, 23)



C. (12, 24)

D. (15, 25)



Q25 Mathematics

The radius and height of a cylinder are in the ratio 2 : 1 Find its total surface area if curved surface area is 616 m^2 .

A. 908 m^2

B. 1512 m^2

C. 1232 m^2

D. 1848 m^2



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Which vulgar fraction is equal in value to the mixed recurring decimal $0.3125125125\dots$?

A. $\frac{1561}{4995}$



B. $\frac{1783}{4995}$

C. $\frac{1653}{4995}$

D. $\frac{1967}{4995}$

Q2 Mathematics

In $\triangle PQR$, $\angle PQR = 90^\circ$, $m(\overline{PQ}) = 3$ cm and $m(\overline{PR}) = 6$ cm. What is the measure of $\angle PRQ$?

A. 30°



B. 45°

C. 60°

D. 70°

Q3 Mathematics

Today, age of the father is twice the sum of the ages of his 3 children. After 15 years father's age will be equal to the sum of the ages of his children. How old is the father 15 years from today?

A. 75 years

B. 85 years

C. 90 years

D. 95 years

Dropped by RRB: discrepancy found in question/answer, ignored for all candidates (no answer key).



Q4 Mathematics

I walk at a speed of 10 km/h and reach the destination in 2 hrs. If I increase my speed by 5 km/h, how early would I reach my destination?

- A. 20 min
- B. 30 min
- C. 40 min
- D. 50 min



Q5 Mathematics

The LCM of two numbers is 385 and their HCF is 7. If the sum of the two numbers is 112, then their difference is:

- A. 42
- B. 35
- C. 50
- D. 43



Q6 Mathematics

A shopkeeper offered successive discounts of 10% and 15% on an article having a marked price of ₹28,000. Find the selling price of the article.

- A. ₹21,420
- B. ₹21,240
- C. ₹22,140
- D. ₹21,402



Q7 Mathematics

The least number which, when diminished by 7, is divisible by 12, 16, 18 and 21 is:

- A. 1150
- B. 1051
- C. 1105
- D. 1015



Q8 Mathematics

Find the value of $\frac{\sqrt{729}}{15} \times \frac{25}{\sqrt{81}} \times \frac{15}{\sqrt{225}}$.

A. 4

B. 3

C. 2

D. 5



Q9 Mathematics

For the following data, find the weighted mean.

X_i 4 3 5 7 2 1

W_i 1 0 2 1 3 5

A. 5.6

B. 2.66



C. 8

D. 7.5

Q10 Mathematics

A sum was invested at a certain rate of simple interest per annum for 2 years. Had it been invested at 2% per annum more than the existing rate, the simple interest accrued in the 2 years would have been ₹240 more. Find the sum invested.

A. ₹8,000

B. ₹24,000

C. ₹6,000



D. ₹16,000



Q11 Mathematics

Two pipes A and B can fill the tank in 5 hours and 8 hours, respectively. Pipe C can empty the same tank in 10 hours. Find the time taken to fill the empty tank when all the pipes are opened simultaneously.

A. $4\frac{2}{9}$ hours

B. $4\frac{5}{9}$ hours

C. $4\frac{7}{9}$ hours

D. $4\frac{4}{9}$ hours

**Q12** Mathematics

Simplify $\frac{3^3 \times 2^4 \times 7^2}{3^2 \times 56}$.

A. 42

B. 36

C. 28

D. 70

**Q13** Mathematics

Find the mean proportional between 17 and 68.

A. 34

B. 38

C. 42

D. 46

**Q14** Mathematics

Simplify $(a + 2b - c)(b - c) + (a - c)2b + b^2$.

A. $3b^2 + 3ab - 5bc - ac$

B. $2b^2 + 3ab - 4bc + c$

C. $3b^2 + c^2 + 3ab - 5bc - ac$

D. $3ab - 5bc - ac - 2abc$



Q15 Mathematics

The roots of quadratic equation that satisfies $12x^2 = 27x$ are:

A. $1, \frac{3}{4}$

B. $1, \frac{4}{3}$

C. $0, \frac{9}{4}$ ✓

D. $0, \frac{3}{4}$

Q16 Mathematics

If the surface area of a spherical ball is 616 m^2 , its volume is:

A. 1238.33 m^3

B. 1786.35 m^3

C. 1657.29 m^3

D. 1437.33 m^3 ✓

Q17 Mathematics

A, B and C started a business with investments in the ratio $20 : 15 : 12$. After 3 months C withdrew half of his investment and after another 9 months, a profit of ₹ 3,23,000 is divided among them. The share of C is:

A. ₹1,14,000

B. ₹1,57,000

C. ₹57,000 ✓

D. ₹1,52,000

Q18 Mathematics

A parallelogram has one parallel side length of 12 cm and perpendicular distance between its base and other parallel side is 8 cm. Its area is _____.

A. 96 cm^2 ✓

B. 48 cm^2

C. 24 cm^2

D. 192 cm^2



Q19 Mathematics

Find the volume of a cuboid whose length is 12 m, breadth is 10 m, and height is 15 m.

A. 1800 m^3



B. 1800 m^2

C. 1500 m^3

D. 1500 m^2

Q20 Mathematics

Find the mean of the following data.

X	3	2	10	4	5
f	5	3	4	2	6

A. 6.52

B. 4.95



C. 8.65

D. 3.68

Q21 Mathematics

Solve $(a - b)^3 + (b - 2c)^3 + (-a + 2c)^3$.

A. $a - b + 2c$

B. $(a - b + 2c)^2$

C. $a - 2c + 4b$

D. $3((a - b)(b - 2c)(-a + 2c))$



Q22 Mathematics

In certain store, the profit is 260% of the cost. If the selling price is ₹7,200, then the cost price is:

A. ₹2,000



B. ₹2,200

C. ₹2,420

D. ₹3,000



Q23 Mathematics

What is the nature of the roots of $3x^2 - 6x + 5 = 0$?

- A. The roots are real and equal.
- B. The roots are real and distinct.
- C. The roots are real and more than 2.
- D. There are no real roots.



Q24 Mathematics

Chandra is 10 years younger than Chandrika. 5 years later Chandrika will be twice as old as Chandra. Find Chandrika's present age.

- A. 10 years
- B. 15 years
- C. 20 years
- D. 25 years



Q25 Mathematics

In triangle ABC, $AB = 3$ m, $BC = 4$ m, and $AC = 5$ m. In triangle PRQ, $PR = 4$ m, $PQ = 5$ m, and $RQ = 3$ m.

Which of the following is a correct order of congruency?

- A. $\triangle BAC$ congruent to $\triangle RPQ$
- B. $\triangle BCA$ congruent to $\triangle RPQ$
- C. $\triangle CBA$ congruent to $\triangle RPQ$
- D. $\triangle ABC$ congruent to $\triangle RPQ$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Simplify $(2z - 5y)^2 + (5z + 2y)^2 - 25z^2$.

A. $19y^2 + 4z^2$

B. $29y^2 + 4z^2$ ✓

C. $29y^2 - 4z^2$

D. $19y^2 - 4z^2$

Q2 Mathematics

If $25x^3 = 1600$, then which of the following is a possible value of x ?

A. 4 ✓

B. 2

C. 3

D. 5

Q3 Mathematics

Find the mode of the given frequency distribution.

x	0-10	10-20	20-30	30-40	40-50
f	5	8	10	2	5

A. 20

B. 22 ✓

C. 24

D. 26



Q4 Mathematics

Find the greatest number by which when the numbers 57, 95 and 211 are divided, it leaves the same remainder in each case.

A. 1

B. 2



C. 3

D. 4

Q5 Mathematics

The marked price of a book is ₹900. A man bought the same for ₹693 after getting two successive discounts, the first being 12%. What was the second discount rate?

A. 11.5%

B. 12.5%



C. 13.5%

D. 14.5%

Q6 Mathematics

The cost of two chairs and three tables is ₹1,450. If a chair costs ₹250 less than a table, then find the cost of one table.

A. ₹350

B. ₹390



C. ₹440

D. ₹320

Q7 Mathematics

It takes two pipes A and B, running together, to fill a tank completely in 4 minutes. If it takes A, 6 minutes less than B, to fill the tank completely, then what will be the time taken by B alone to fill the tank completely?

A. 6 min

B. 12 min



C. 20 min

D. 15 min



Q8 Mathematics

ΔABC is similar to ΔFED and $AB = x$ cm, $BC = x + 2$ cm, $EF = 12$ cm, and $ED = 18$ cm. The value of x is _____.

- A. 2 cm
- B. -2 cm
- C. 4 cm
- D. -4 cm

**Q9 Mathematics**

A clock marked for ₹10,000 is available on successive discounts of 40% and $k\%$. If the selling price of the clock is ₹2,400, then find the value of k .

- A. 36%
- B. 60%
- C. 24%
- D. 40%

**Q10 Mathematics**

If $\Delta ABC \cong \Delta PQR$, which of the following need NOT be NECESSARILY true?

- A. $m(\overline{AB}) = m(\overline{PQ})$; $m(\overline{BC}) = m(\overline{QR})$; $m(\overline{CA}) = m(\overline{PR})$
- B. $\angle A = \angle P$; $\angle B = \angle Q$; $\angle C = \angle R$
- C. $m(\overline{AB}) = m(\overline{PQ})$; $m(\overline{BC}) = m(\overline{QR})$; $\angle A = \angle P$
- D. $m(\overline{AB}) = m(\overline{PQ})$; $m(\overline{BC}) = m(\overline{RP})$; $\angle A = \angle P$

**Q11 Mathematics**

If $\operatorname{cosec} 2A = \sec(A - 15^\circ)$, then find the measure of A (in degrees).

- A. 15
- B. 23
- C. 35
- D. 45



Q12 Mathematics

The ratio between the present ages of P and Q is 7 : 5, respectively. The ratio between P's age 5 years ago and Q's age 5 years hence is 1 : 1. What is the ratio between P's age 5 years hence and Q's age 5 years ago?

A. 2 : 1



B. 1 : 2

C. 3 : 2

D. 2 : 3

Q13 Mathematics

The equation $2x^2 + 7x + 6 = 0$ can be written as:

A. $(2x - 3)(x + 2) = 0$ B. $(2x + 3)(x + 2) = 0$ C. $(2x - 3)(x - 2) = 0$ D. $(2x + 3)(x - 2) = 0$ **Q14** Mathematics

A semi-circular field of radius 14 m needs to be fenced with a wire. Find the length of wire required.

A. 44 m

B. 46 m

C. 72 m



D. 80 m

Q15 Mathematics

The difference of the ages of two siblings is 7 years. If the sum of their ages is 21 years, how old is the younger of the siblings?

A. 14 years

B. 10 years

C. 7 years



D. 3 years



Q16 Mathematics

A sum of money is distributed among four persons A, B, C and D in the ratio 4: 7: 9: 3. If C gets ₹800 more than B, then find the amount that D gets.

A. ₹1,000

B. ₹1,200



C. ₹1,400

D. ₹1,500

Q17 Mathematics

A and B can together complete a piece of work in 9 days, B and C together can complete the same work in 18 days and C and A together can complete it in 27 days. In how many days can A, B, and C, working together complete the same work?

A. $8\frac{9}{11}$ daysB. $9\frac{7}{11}$ daysC. $9\frac{9}{11}$ daysD. $9\frac{8}{11}$ days**Q18** Mathematics

If $a^2 + b^2 = 50$ and $a \times b = 7$. Find $\frac{(a-b)}{(a+b)}$, where $a > b$.

A. $\frac{3}{4}$ B. $\frac{3}{5}$ C. $\frac{4}{3}$ D. $\frac{5}{3}$ 

Q19 Mathematics

Village A has a population of 72,000, which is decreasing at the rate of 1,000 per year. Village B has a population of 54,000, which is increasing at the rate of 800 per year. In how many years will the population of both the villages be the same?

A. 7

B. 10



C. 12

D. 15

Q20 Mathematics

The mean proportional of 0.25 and 0.64 is

A. 0.4



B. 0.5

C. 0.6

D. 0.7

Q21 Mathematics

Find the total surface area of a closed cuboid whose length, breadth and height are 16 cm, 12 cm, and 8 cm, respectively.

A. 823 cm^2 B. 382 cm^2 C. 832 cm^2 D. 238 cm^2 **Q22** Mathematics

If a sum of ₹3,500 is invested at 5% compound interest per annum, compounded annually, then what is the period for which the compound interest is ₹358.75?

A. 18 months

B. 20 months

C. 24 months



D. 15 months



Q23 Mathematics

How many numbers between 1 to 150 are divisible by 3 and 4 both?

A. 9

B. 10

C. 11

D. 12



Q24 Mathematics

The average of 70 values is 40. If each value is multiplied by 20, what will be the changed average?

A. 1400

B. 90

C. 800



D. 60

Q25 Mathematics

If one of the roots of a quadratic equation is $\frac{1}{2-\sqrt{2}}$, then find the quadratic equation.

A. $2x^2 - 4x + 1 = 0$



B. $\sqrt{2}x^2 + 3x + 2 = 0$

C. $\sqrt{2}x^2 + 3x - 2 = 0$

D. $-2x^2 + 3x + 5 = 0$



Mathematics

25 Questions · Answer Key

Q1 Mathematics HINDI - no English version saved

राम की आयु भीम की आयु से 6 वर्ष कम है। 3 वर्ष के बाद भीम की आयु राम से दोगुनी होगी। राम की वर्तमान आयु ज्ञात कीजिए।

A. 3 वर्ष



B. 4 वर्ष

C. 5 वर्ष

D. 6 वर्ष

Q2 Mathematics HINDI - no English version saved

यदि $x - \frac{1}{x} = 8$ है, तो $x^3 - \frac{1}{x^3}$ का मान ज्ञात कीजिए।

A. 425

B. 489

C. 541

D. 536



Q3 Mathematics HINDI - no English version saved

$0.4\overline{32}$ को $\frac{p}{q}$ के रूप में व्यक्त कीजिए, जहां p और q पूर्णांक हैं, और $q \neq 0$ है।

A. $\frac{495}{214}$ B. $\frac{214}{495}$ C. $\frac{173}{465}$ D. $\frac{465}{173}$ 

Q4 Mathematics HINDI - no English version saved

यदि 27 और n का लघुत्तम समापवर्त्य (LCM) 54 है, और महत्तम समापवर्तक (HCF) 9 है, तो n का मान ज्ञात कीजिए।

A. 18



B. 36

C. 54

D. 24

Q5 Mathematics HINDI - no English version saved

₹275 के अंकित मूल्य वाली किसी वस्तु को 5% छूट पर बेचा जाता है। विक्रेता को फिर भी 4.5% का लाभ प्राप्त होता है। उसने इसके लिए कितना भुगतान किया था?

A. ₹125

B. ₹200

C. ₹250



D. ₹225

Q6 Mathematics HINDI - no English version saved

त्रिभुज ABC और PQR में, $AB = AC$, $\angle C = \angle P$ और $\angle B = \angle Q$ है। तो दोनों त्रिभुज _____।

A. समद्विबाहु तथा सर्वांगसम हैं।

B. समद्विबाहु हैं, किंतु सर्वांगसम नहीं हैं।



C. सर्वांगसम हैं, किंतु समद्विबाहु नहीं हैं।

D. न तो सर्वांगसम हैं, और न ही समद्विबाहु हैं।

Q7 Mathematics HINDI - no English version saved

एक चोर ने एक पुलिसकर्मी को 150 m की दूरी से देखा। चोर तुरंत 13 km/h की चाल से भागने लगा और पुलिसकर्मी ने 14 km/h की चाल से उसका पीछा किया। 6 मिनट की दौड़ के बाद उनके बीच की दूरी ज्ञात करें।

A. 100 m

B. 125 m

C. 50 m



D. 75 m



Q8 Mathematics HINDI - no English version saved

वह द्विघात समीकरण ज्ञात कीजिए, जिसके मूल, द्विघात समीकरण $2x^2 + 4x - 1 = 0$ के मूलों के योग और गुणनफल के बराबर हों।

A. $2x^2 + 5x + 2 = 0$



B. $2x^2 - x + 5 = 0$

C. $x^2 + 2x + 5 = 0$

D. $-x^2 + 5x + 1 = 0$

Q9 Mathematics HINDI - no English version saved

X हर महीने अपनी आय का 16% यात्रा पर, 40% किराने के सामान पर, और 14% पारिवारिक चिकित्सा खर्च पर व्यय करता है। उसके पास ₹9,630 की राशि शेष बचती है। उसकी वार्षिक आय ज्ञात कीजिए।

A. ₹3,85,200



B. ₹2,85,200

C. ₹32,100

D. ₹23,767

Q10 Mathematics HINDI - no English version saved

दो संख्याओं के लघुत्तम समापवर्त्य (LCM) और महत्तम समापवर्तक (HCF) का अनुपात 3 : 1 है, और उन संख्याओं का गुणनफल 432 है। लघुत्तम समापवर्त्य (LCM) और महत्तम समापवर्तक (HCF) का मान क्रमशः ज्ञात कीजिए।

A. 36 और 12



B. 24 और 18

C. 72 और 24

D. 54 और 8



Q11 Mathematics HINDI - no English version saved

यदि $4 + 4^{n+5} = 260$ है, तो 5^{n+3} का मान ज्ञात कीजिए।

A. 49

B. 36

C. 25



D. 16

Q12 Mathematics HINDI - no English version saved

यदि A एक न्यून कोण है, और $\tan^2 A + \sec A = 11$ है, तो $\cot A$ का मान ज्ञात कीजिए।

A. $\frac{1}{2\sqrt{7}}$

B. $\frac{1}{2\sqrt{5}}$

C. $\frac{1}{2\sqrt{2}}$



D. $\frac{1}{2\sqrt{3}}$

Q13 Mathematics HINDI - no English version saved

$x^2 - 2x + 3 = 0$ एक _____ है।

A. द्विघात समीकरण



B. घन समीकरण

C. द्विघात बहुपद

D. घन बहुपद

Q14 Mathematics HINDI - no English version saved

यदि किसी संख्या का एक तिहाई स्वयं उस संख्या से 4 कम है, तो वह संख्या ज्ञात कीजिए।

A. 3

B. 4

C. 5

D. 6



Q15 Mathematics HINDI - no English version saved

यदि $(2x + 7y) : (4x - 3y) :: 8 : 3$ है, तो $x:y$ का मान ज्ञात कीजिए।

A. 26 : 45

B. 20 : 19

C. 45 : 26



D. 11 : 13

Q16 Mathematics HINDI - no English version saved

यदि किसी विशेष डेटा समुच्चय की माध्यिका और बहुलक क्रमशः 12 और 15 है, तो एक अनुभवजन्य संबंध का उपयोग करते हुए, उसी डेटा समुच्चय के माध्य का मान ज्ञात करें।

A. 12

B. 11

C. 10

D. 10.5



Q17 Mathematics HINDI - no English version saved

एक समलंबाकार मैदान PQRS में, $PQ \parallel RS$, $PQ = 12\text{ m}$, $RS = 22\text{ m}$ है, PQ और RS के बीच की दूरी 14 m है। इसमें समान क्षेत्रफलों में दो फसलों की बुवाई की जानी है। प्रत्येक फसल के लिए उपलब्ध क्षेत्रफल ज्ञात कीजिए।

A. 119 m^2



B. 238 m^2

C. 190 m^2

D. 213 m^2

Q18 Mathematics HINDI - no English version saved

किसी दिए गए आंकड़ों के लिए, माध्य और बहुलक का अंतर 72 है। माध्य, माध्यिका और बहुलक के बीच के प्रयोगसिद्ध संबंध का उपयोग करके, इसके माध्य और माध्यिका का अंतर ज्ञात कीजिए।

A. 32

B. 28

C. 26

D. 24



Q19 Mathematics HINDI - no English version saved

यदि ₹9,375 की राशि, अर्ध-वार्षिक चक्रवृद्धि आधार पर गणनीय 8% वार्षिक चक्रवृद्धि ब्याज दर पर निवेश की जाती है, तो एक वर्ष बाद प्राप्त होने वाला मिश्रधन ज्ञात कीजिए।

A. ₹10,220

B. ₹10,430

C. ₹10,140



D. ₹10,300

Q20 Mathematics HINDI - no English version saved

एक दुकानदार को अपने माल का अंकित मूल्य, क्रय मूल्य से कितने प्रतिशत अधिक रखना चाहिए, ताकि अंकित मूल्य पर 8% की छूट देने के बाद भी उसे 15% का लाभ हो?

A. 25%



B. 27%

C. 30%

D. 40%

Q21 Mathematics HINDI - no English version saved

एक समांतर चतुर्भुज ABCD में, AD और AC के मध्य बिंदुओं को मिलाने वाली रेखा की लंबाई 2 इकाई है। यदि समांतर चतुर्भुज का परिमाप 20 इकाई है, तो AD की लंबाई ज्ञात कीजिए।

A. 8 इकाई

B. 5 इकाई

C. 4 इकाई

D. 6 इकाई



Q22 Mathematics HINDI - no English version saved

मोहन की आयु रोहन की आयु की 150% है। सोहन की आयु रोहन की आयु की 250% है। यदि इन तीनों व्यक्तियों की आयु का योग 60 वर्ष है, तो रोहन की आयु ज्ञात कीजिए।

A. 12 वर्ष



B. 13 वर्ष

C. 14 वर्ष

D. 15 वर्ष



Q23 Mathematics HINDI - no English version saved

5 cm लंबाई, 10 cm चौड़ाई और 15 cm ऊंचाई वाला एक बॉक्स बनाने के लिए आवश्यक प्लास्टिक शीट का क्षेत्रफल ज्ञात कीजिए।

A. 550 cm^2



B. 500 cm^2

C. 600 cm^2

D. 650 cm^2

Q24 Mathematics HINDI - no English version saved

देवेंद्र एक कार्य को 20 दिन में पूरा कर सकता है, जबकि ईश्वर उसी कार्य को 25 दिन में पूरा कर सकता है। यदि वे देवेंद्र से शुरू करके एक-एक दिन छोड़कर बारी-बारी से कार्य करते हैं, तो कार्य पूरा होने में कितने दिन लगेंगे?

A. $25\frac{3}{5}$ दिन

B. $24\frac{4}{5}$ दिन

C. $23\frac{2}{5}$ दिन

D. $22\frac{1}{5}$ दिन



Q25 Mathematics HINDI - no English version saved

यदि $5 \times 7 - [23 - \{35 - (20 - x)\}] = 42$ है, तो x का मान ज्ञात कीजिए।

A. 17

B. -17

C. -15

D. 15



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Raghu invests ₹5,00,000 in the name of his daughter, who is 16 years old, in a scheme that pays 5% compound interest per annum, compounded annually. What will be the total amount due to the daughter when she turns 18 years old?

A. ₹ 5,52,150

B. ₹5,51,520

C. ₹ 5,15,250

D. ₹5,51,250



Q2 Mathematics

Express $0.13\overline{241}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{3307}{24975}$ B. $\frac{3807}{24975}$ C. $\frac{3337}{24160}$ D. $\frac{3287}{21780}$

Q3 Mathematics

A dishonest dealer professes to sell his goods at cost price but uses a false weight and thus gains 20%. For a kilogram he uses a weight of how many grams?

A. 750.5 gm

B. 708.06 gm

C. 833.33 gm



D. 785.5 gm



Q4 Mathematics

A retailer would have made a profit of 18% if he sold an article at its marked price. If he allowed a discount of 10% on the marked price, what would his actual profit on that article have been?

A. 6.2%



B. 5.5%

C. 4.6%

D. 7.1%

Q5 Mathematics

For a given data, if mean and mode are 42 and 60, respectively, then find the median of the data using empirical relation.

A. 48



B. 46

C. 44

D. 50

Q6 Mathematics

A and B together can complete a work in 12 days. A alone can complete it in 20 days. If B does the work only for the first half of the day daily, then in how many days will A and B together complete the work?

A. $\frac{22}{3}$ days

B. $\frac{43}{2}$ days

C. 15 days



D. $\frac{40}{3}$ days

Q7 Mathematics

Find the measure of each exterior angle of a regular octagon.

A. 120°

B. 60°

C. 135°

D. 45°



Q8 Mathematics

Find the surface area of a sphere with a diameter $\frac{1}{2}$ cm.

A. $\pi^2 \text{ cm}^2$

B. $\frac{\pi}{4} \text{ cm}^2$ ✓

C. $\frac{\pi}{2} \text{ cm}^2$

D. $2\pi^2 \text{ cm}^2$

Q9 Mathematics

The sum of the prime factors of $9^6 \times 12^4 \times 7^7$ is:

A. 14

B. 13

C. 11

D. 12 ✓

Q10 Mathematics

If a and b are the roots of the equation $x^2 - 5x - 14 = 0$, then the value of $a^3b^2 + a^2b^3$ is:

A. 670

B. 790

C. 840

D. 980 ✓

Q11 Mathematics

If $x = 2 + \sqrt{5}$ and $y = 2 - \sqrt{5}$, then the value of $x^2 + y^2$ is:

A. 18 ✓

B. 16

C. 20

D. 22



Q12 Mathematics

Simplify $6^2 + 3^2 + 2^4$.

A. 61



B. 45

C. 52

D. 63

Q13 Mathematics

A and B can complete a piece of work in 10 days and 12 days, respectively. If they work on alternate days beginning with A, then in how many days will the work be completed?

A. 10

B. $10\frac{5}{6}$



C. $10\frac{1}{4}$

D. $10\frac{1}{2}$

Q14 Mathematics

If, for $x > 0$, the mean of 22.5, 56, 42.5, $2x+1$, $x-2$, $3x$, 36 is 30; then the value of x is _____.

A. 7

B. 9



C. 4

D. 6

Q15 Mathematics

Find the remainder, when $171 \times 172 \times 173$ is divided by 17.

A. 9

B. 6



C. 7

D. 8



Q16 Mathematics

A 3-digit number is such that the unit digit, tens digit and hundreds digit are in the ratio 1 : 2 : 3. The sum of this number and its reversed number is 1332. Find the number

A. 414

B. 246

C. 123

D. 369



Q17 Mathematics

The value of $2 - \frac{\sin^2 \alpha}{1 - \cos \alpha} + \frac{1 - \cos \alpha}{\sin \alpha} - \frac{\sin \alpha}{1 + \cos \alpha}$ is

A. $1 + \cos \alpha$

B. $1 - \cos \alpha$

C. $1 + \sin \alpha$

D. $1 - \sin \alpha$



Q18 Mathematics

Which of the following is true?

a) Every trapezium is a parallelogram.

b) Every parallelogram is a square.

c) Every rectangle is a square.

d) Every square is a rhombus.

A. both a and b

B. only a

C. only d

D. only c



Q19 Mathematics

A's salary is 20% less than B's salary. By how much per cent is B's salary more than A's?

A. 25%



B. 20%

C. 15%

D. 17%

Q20 Mathematics

Ramya got married 10 years ago. Now her age is $1\frac{1}{5}$ times her age at the time of marriage. Her daughter's age is one-tenth of her present age. Find her daughter's present age.

A. 12 years

B. 6 years



C. 8 years

D. 20 years

Q21 Mathematics

Bhuvan's salary was first decreased by 16% and subsequently increased by 25%. Find the net percentage change in his salary.

A. 5% increase



B. 10% increase

C. 5% decrease

D. 10% decrease

Q22 Mathematics

If $x^3 - 3x + 6 = 0$, then it is:

A. a quadratic equation

B. not a quadratic equation



C. a quadratic expression

D. a linear equation



Q23 Mathematics

Solve: $3(5x^2 - 7) - 5(3x^2 + 2x - 7) = -16$

A. 2

B. 3



C. 4

D. 5

Q24 Mathematics

If the breadth and height of a closed cuboid are, respectively, 25% and 50% of its length of 12 cm, then find the total surface area of this cuboid.

A. 63 cm^2

B. 522 cm^2

C. 126 cm^2

D. 252 cm^2

**Q25** Mathematics

The sum of the ages of five children born at the intervals of three years each is 60 years. What is the age of the youngest child?

A. 4 years

B. 5 years

C. 6 years



D. 7 years



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Which of the identities given below is NOT true?

A. $\sec^2\theta - \tan^2\theta = 1$

B. $\tan^2\theta + \cot^2\theta = 1$ ✓

C. $\operatorname{cosec}^2\theta - \cot^2\theta = 1$

D. $\sin^2\theta + \cos^2\theta = 1$

Q2 Mathematics

The value of

$$\left\{ \left(234^5 - 243^8 + \frac{1}{72} \right)^{-8} \right\}^0 + 8 =$$

A. 234

B. 10

C. 9 ✓

D. 243

Q3 Mathematics

The ratio of milk to water in 10 litres of a mixture is 3: 2. If this ratio is to be made 2: 3, then the quantity of water to be added further to the mixture is:

A. 10 litres

B. 8 litres

C. 5 litres ✓

D. 12 litres

Q4 Mathematics

A man brought some fruits at 14 for ₹30 and sold them at 7 for ₹20. What is his profit percentage?

A. 30%

B. 33.33% ✓

C. 36.33%

D. 20%



Q5 Mathematics

The internal bisectors of $\angle B$ and $\angle C$ of $\triangle ABC$ meet at D. If $\angle A = 75^\circ$, the $\angle BDC$ is:

A. 127.5°



B. 112.5°

C. 105.5°

D. 102.5°

Q6 Mathematics

If $\text{GCD}(108, 36) = \text{GCD}(x, 72)$ then what is the minimum possible value of x ?

A. 24

B. 36



C. 12

D. 72

Q7 Mathematics

By what per cent does the curved surface area of a cylinder decrease, if the radius is increased by 10% and the height is decreased by 40%?

A. 20%

B. 34%



C. 51.6%

D. 24.3%

Q8 Mathematics

If a person covers a distance of 90 km at a speed of 45 km/h and another distance of 150 km at a speed of 50 km/h, then his average speed for the whole journey is:

A. 48 km/h



B. 47 km/h

C. 49 km/h

D. 46 km/h



Q9 Mathematics

The value of $\frac{1}{4} + \frac{2}{5} \div \left[\left\{ 2\frac{1}{5} - 2 \right\} \times 5 \right] - \frac{2}{3} \times \frac{3}{5}$ is:

A. $\frac{3}{5}$

B. $\frac{5}{6}$

C. $\frac{1}{4}$ ✓

D. $\frac{2}{3}$

Q10 Mathematics

Find the sum of the roots of the quadratic equation $7x^2 + 28x + 1 = 0$.

A. 28

B. -4 ✓

C. 1

D. $-\frac{1}{7}$

Q11 Mathematics

If $a + b = 48$ and $ab = 56$, then what is the value of $a^3 + b^3$?

A. 1,20,528

B. 1,20,825

C. 1,02,258

D. 1,02,528 ✓



Q12 Mathematics

Which of the following is true for a square?

- a) All angles equal
- b) All sides parallel
- c) Diagonals equal
- d) All sides equal

A. a, b, c

B. a, c, d



C. b, c, d

D. a, b

Q13 Mathematics

A dishonest shopkeeper claims to sell rice at the cost price of ₹95 per kg, but the weight he uses has 1 kg written on it, while it actually weighs 950 gms. The profit he thus earns on selling rice having an actual weight of 100 kg rice is:

A. ₹275

B. ₹375

C. ₹475

D. ₹500



Q14 Mathematics

If T denotes the sum of money, M denotes the number of years and P denotes the rate of interest, then the compound interest is given by:

A. $M(1 + T/100)^P - T$

B. $M(1 + M/100)^P$

C. $T(1 + P/100)^M - T$



D. $T(1 + P/100)^M$



Q15 Mathematics

Find the median of the given frequency distribution.

Class Interval	0-10	10-20	20-30	30-40	40-50
f	10	8	7	9	12

A. $\frac{190}{7}$



B. $\frac{250}{7}$

C. $\frac{290}{7}$

D. $\frac{150}{7}$

Q16 Mathematics

Using $\pi = \frac{22}{7}$, find the total surface area of a cylinder whose radius of base is 7 cm and height is 8 cm.

A. 625 cm^2

B. 660 cm^2



C. 665 cm^2

D. 710 cm^2

Q17 Mathematics

The fraction equivalent to 0.4363636..... is:

A. $\frac{42}{100}$

B. $\frac{236}{99}$

C. $\frac{24}{55}$



D. $\frac{42}{99}$



Q18 Mathematics

Meenu alone can do a work in 16 days. Simi alone can do it in 12 days. If Raj joins them, they three together can complete the work in 4 days. How long will Raj alone take to finish the work?

A. 23 days

B. $\frac{12}{7}$ days

C. $\frac{48}{5}$ days



D. $\frac{111}{2}$ days

Q19 Mathematics

P, Q and R can do a piece of work in 9 days, 18 days and 12 days, respectively. They start the work, with P working on Day 1, Q working on Day 2 and R working on Day 3, and then continuing with this cycle till the work got is completed. How many days will be needed to complete this work in this manner?

A. 11 days

B. 12 days



C. 15 days

D. 16 days

Q20 Mathematics

The population of a village was 4,00,000. It increased by 20% in the first year and increased by 30% in the second year. Its population after these two years is _____.

A. 5,20,000

B. 5,40,000

C. 6,25,000

D. 6,24,000

**Q21** Mathematics

If the roots of quadratic equation $(2 - p)x^2 + 2px - (p + 1) = 0$ are equal, then the value of p is:

A. 2

B. -2



C. -1

D. 1



Q22 Mathematics HINDI - no English version saved

$2x - 3y + 7z$ और $4z - 5x$ के योगफल को $12x - z$ से घटाएं।

A. $3x + 3y - 3z$

B. $4x + 7y$

C. $15x + 3y - 12z$ ✓

D. $1x + 12y - 12z$

Q23 Mathematics

Find the negative root of $3x^2 + 12x - 15 = 0$.

A. $x = -1$

B. $x = -5$ ✓

C. $x = 5$

D. $x = 1$

Q24 Mathematics

The prime factorisation of the number 266805 is:

A. $3 \times 5 \times 7^3 \times 11^2$

B. $3^3 \times 5^2 \times 7 \times 11^2$

C. $3^2 \times 5 \times 7^2 \times 11^2$ ✓

D. $3^4 \times 5^2 \times 7^2 \times 11^2$

Q25 Mathematics

If the opposite angles of a cyclic quadrilateral are in the ratio 3 : 7, then the measure of the bigger angle among the two is

A. 105°

B. 140°

C. 70°

D. 126° ✓



Mathematics

25 Questions • Answer Key

Q1 Mathematics

If the area of a circle is $196\pi \text{ m}^2$ then the perimeter of the circle is _____

A. 44 m

B. 88 m



C. 76 m

D. 58 m

Q2 Mathematics

Cost price of a toy is ₹210. What should be its MRP so that after a discount of 5% shopkeeper gains 90%.

A. ₹480

B. ₹400

C. ₹420



D. ₹450

Q3 Mathematics

Which of the following quadratic equations has one of its roots as $2 + \sqrt{5}$?

A. $x^2 + 5x + 1 = 0$ B. $x^2 - 5x - 1 = 0$ C. $x^2 - 4x - 1 = 0$ D. $x^2 + 4x + 1 = 0$

Q4 Mathematics

If the age of Ratan is one-third the age of Jatin and the sum of their ages is 84 years, then find the age of Jatin.

A. 63 years



B. 36 years

C. 52 years

D. 25 years



Q5 Mathematics

The median of 9, 11, 15, 17, x, 19, 21 is x, where x is an integer. Which of the following can be the value of x?

A. 13

B. 14

C. 16



D. 18

Q6 Mathematics

Simplify: $x(2x - 5) + 6(x^2 - 4) + 18$

A. $8x^2 - 5x + 6$

B. $8x^2 - 5x - 6$



C. $8x^2 + 5x - 6$

D. $8x^2 + 5x + 6$

Q7 Mathematics

Simplify:

$$9991 \times 10009 =$$

A. 99,999,19

B. 99,999,99

C. 91,999,919

D. 99,999,919



Q8 Mathematics

A car travels 80 km at the speed of 20 km/h and the next 30 km at the speed of 30 km/h. What is its average speed?

A. 30 km/h

B. 20 km/h

C. 22 km/h



D. 40 km/h



Q9 Mathematics

Find the circumference of a circle that circumscribes a square of side 7 cm. (Use $\pi = \frac{22}{7}$.)

A. $22\sqrt{2}$ cm



B. 22 cm

C. 44 cm

D. $44\sqrt{2}$ cm

Q10 Mathematics

10 buckets of water fill a tank when the capacity of each bucket is 14 litres. How many buckets will be needed to fill the same tank, if the capacity of each bucket is 7 litres?

A. 15

B. 18

C. 20



D. 23

Q11 Mathematics

Which of the following relations would calculate the cost x of m notebooks, if the cost of n notebooks is ₹1,680

A. $\frac{m}{x} = \frac{1680}{n}$

B. $\frac{m}{x} = \frac{n}{1680}$



C. $\frac{x}{m} = \frac{n}{m}$

D. $x = \frac{1680}{m}$

Q12 Mathematics

Find the compound interest on ₹12,500 at 3% per annum for 3 years when interest is compounded annually (correct to the nearest rupees).

A. ₹1,159



B. ₹1,140

C. ₹1,170

D. ₹1,180



Q13 Mathematics

Find the positive difference between the roots of the equation $2x^2 - 7x + 5 = 0$.

A. $\frac{3}{2}$



B. $-\frac{3}{2}$

C. $\frac{5}{2}$

D. $-\frac{5}{2}$

Q14 Mathematics

The value of $\frac{0.2 \times 0.2 \times 0.2 - 0.02 \times 0.02 \times 0.02}{2 \times 2 \times 2} =$

A. 0.00999

B. 0.999

C. 0.000999



D. 0.0090

Q15 Mathematics

If $\cos^4 \theta - \sin^4 \theta = k$, then the value of $\frac{1+k}{1-k}$ is:

A. $\sin^2 \theta$

B. $\operatorname{cosec}^2 \theta$

C. $\tan^2 \theta$

D. $\cot^2 \theta$



Q16 Mathematics

Which of the given numbers is NOT divisible by 3?

A. 453

B. 687

C. 713



D. 927



Q17 Mathematics

Seven men can complete a work in 12 days. They start the work and after 5 days, 3 men leave. In how many days will the remaining work be completed by the remaining men?

A. 14

B. $13\frac{1}{4}$ C. $12\frac{1}{4}$ 

D. 12

Q18 Mathematics

Three successive discounts of 4%, 5% and 14% are equal to a single discount of _____ (rounded off to two decimal places).

A. 20.57%

B. 22.57%

C. 21.57% 

D. 23.57%

Q19 Mathematics

The value of

$$\frac{3}{7} + \frac{2}{7} + \frac{1}{14} + \frac{2}{7} - 3 =$$

A. $\frac{27}{14}$ B. $\frac{13}{14}$ C. $-\frac{13}{14}$ D. $-\frac{27}{14}$ 

Q20 Mathematics

A 1.5 m tall boy is standing at a distance of 3 m from a 4 m high light post. The light from top of post casts his shadow. What is the length of the boy's shadow?

A. 1.8 m ☒

B. 1.62 m

C. 4.4 m

D. 0.91 m

Q21 Mathematics

If the sum of two numbers is 54 and the LCM and HCF of these numbers are 84 and 6, respectively, then the sum of the reciprocal of the numbers is:

A. $\frac{5}{28}$ B. $\frac{3}{28}$ ☒C. $\frac{7}{28}$ D. $\frac{9}{28}$ **Q22** Mathematics

In a class there are 40 students (only boys and girls). The number of girls is three-sevenths of the number of boys. Find the number of boys in the class.

A. 12

B. 32

C. 28 ☒

D. 24

Q23 Mathematics

Express $\sin 58^\circ + \cos 82^\circ$ in terms of Trigonometric ratios of angles between 0° and 45° .

A. $\sin 32^\circ + \sin 8^\circ$ B. $\sin 32^\circ + \cos 8^\circ$ C. $\cos 32^\circ + \sin 8^\circ$ ☒D. $\cos 32^\circ + \cos 8^\circ$ 

Q24 Mathematics

Find the value of $\sqrt{9604}$.

A. 74

B. 72

C. 98



D. 89

Q25 Mathematics

In an election between two candidates, the winner received 1854 votes and the loser received 618 votes. What percentage of the total number of votes received by the two candidates went in favour of the winning candidate?

A. 60

B. 80

C. 70

D. 75



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A trader owes a merchant ₹8,000 due in one year. The trader wants to settle the account after 2 months. If the rate of interest is 9% per annum, then how much should he pay (rounded off value)?

A. ₹7,244

B. ₹7,424

C. ₹7,442



D. ₹4,774

Q2 Mathematics

A train crosses a platform 90 metres long in 60 seconds at a speed of 54 km/h. Find the time the train will take to cross an electric pole.

A. 60 seconds

B. 48 seconds

C. 54 seconds



D. 58 seconds

Q3 Mathematics

Simplify: $2\left(\frac{3}{2}x^2 - 24x + 12\right) - 3(x^2 + 4x - 13)$.

A. $60x + 63$ B. $-60x + 63$ C. $-60x - 63$ D. $60x - 63$

Q4 Mathematics

Two numbers are in the ratio 3 : 2. Their LCM and HCF are 24 and 4, respectively. The greater of the two numbers is:

A. 8

B. 10

C. 12



D. 14



Q5 Mathematics

If the mean and the mode of a particular data set are 36 and 63, respectively, then, using an empirical relation, find the value of the median of the same data set.

A. 39

B. 40

C. 45



D. 55

Q6 Mathematics

What is the nature of the roots of $\sqrt{3}x^2 + 6x - \sqrt{3} = 0$?

A. The roots are real and equal.

B. The roots are real and distinct.



C. The roots are real and more than 2.

D. There are no real roots.

Q7 Mathematics

The ratio of the number of boys to that of the girls in a school is 7 : 9. If the number of girls in the school is 189, then the number of boys in that school is:

A. 147



B. 168

C. 126

D. 105

Q8 Mathematics

The roots of the quadratic equation $2x^2 - x - 3 = 0$ are:

A. $1, \frac{3}{2}$ B. $1, -\frac{3}{2}$ C. $-1, \frac{3}{2}$ D. $-1, -\frac{3}{2}$ 

Q9 Mathematics

The sum of two natural numbers, x and y , is 320 and the HCF of x and y is 20. If $x > y$, how many such possible pairs of x and y are there?

A. 4



B. 6

C. 2

D. 8

Q10 Mathematics

If the volume of a cube is 729 cm^3 , then the edge of the cube is:

A. 3 cm

B. 9 cm



C. 12 cm

D. 24 cm

Q11 Mathematics

Find the mode of the observations 23, 27, 38, 42, 27, 58, 69, 71, 45.

A. 27



B. 42

C. 45

D. 71

Q12 Mathematics

If a regular polygon has 65 diagonals, then the sum of its interior angles is:

A. 1440°

B. 1620°

C. 1800°

D. 1980°



Q13 Mathematics

A car can cover a distance of 25 km per litre of petrol. The driver of the car filled the tank with $5\frac{1}{2}$ litres of petrol. After travelling how much distance (in km) will the car stop?

A. 125.5

B. 135.5

C. 137.5



D. 140.5

Q14 Mathematics

Aditya bought a flat for ₹5,50,000. He spent ₹25,000 on its painting and repair. If he sold it for ₹5,37,625, then his loss percentage is:

A. 6.5%



B. 7.5%

C. 5.5%

D. 4.5%

Q15 Mathematics

If the total surface area of a closed cube is 1014 cm^2 , then the length of each edge of this cube is:

A. 13 cm



B. 12 cm

C. 14 cm

D. 16 cm

Q16 Mathematics

The value of $143 - 144 \div 16 \times 3 - 1$ is:

A. 139

B. 115



C. 133

D. 123



Q17 Mathematics

If $12 : x :: x : 27$, and $25 : y :: y : 36$, when x and y are both positive numbers, find $x : y$.

A. 5 : 6

B. 3 : 5

C. 4 : 7

D. 7 : 9

Q18 Mathematics

Raj invested ₹14,000 at 10% p.a. for 1 year at compound interest, compounded half-yearly. The amount received by him is:

A. ₹14,354

B. ₹13,542

C. ₹14,765

D. ₹15,435

Q19 Mathematics

Two trains P and Q, having lengths of 300 m and 340 m respectively, are running towards each other. If P and Q are running at speeds of 35 m/s and 45 m/s, respectively, then how long will they take to cross each other?

A. 7 sec

B. 8 sec

C. 8.5 sec

D. 9 sec

Q20 Mathematics

If $a + b = 25$ and $a - b = 13$, find the value of $(a + b)^2$.

A. 625

B. 525

C. 225

D. 496



Q21 Mathematics

If $\sin\theta > \cos\theta$, then the value of $\frac{\sqrt{1-2\sin\theta\cos\theta} + \sqrt{1+2\sin\theta\cos\theta}}{2\tan\theta}$ is:

A. $\cos\theta$



B. $\cot\theta$

C. $\tan\theta$

D. $\sin\theta$

Q22 Mathematics

A son's present age is two-fifth of the age of his mother. After 5 years, his age will be half the age of his mother. How old is his mother at present?

A. 25 years



B. 32 years

C. 36 years

D. 40 years

Q23 Mathematics

A is two years older than B, who is twice as old as C. If the total of their ages is 32, then what is the age of B?

A. 7 years

B. 8 years

C. 12 years



D. 14 years

Q24 Mathematics

If one angle of a triangle is equal to the sum of the other two angles, then the triangle is:

A. a right-angle triangle



B. an isosceles triangle

C. an equilateral triangle

D. an obtuse angle triangle



$$7.44\ldots + 3.77\ldots - 2.55\ldots =$$

A. $\frac{74}{9}$

B. $\frac{78}{9}$ 

C. $\frac{83}{9}$

D. $\frac{124}{9}$



Mathematics

25 Questions · Answer Key

Q1 Mathematics

The point of intersection of the medians of a triangle is called:

- A. Circumcentre
- B. Centroid
- C. Orthocentre
- D. incentre



Q2 Mathematics

Bharat borrowed a sum of ₹10,000 at a certain rate of simple interest for 2 years. If he paid an interest of ₹2,000 at the end of the period, then find the rate of interest per annum.

- A. 25%
- B. 15%
- C. 10%
- D. 20%



Q3 Mathematics

Lakshman and Bharath start a business by investing ₹48,000 and ₹72,000, respectively. What is Bharath's share out of an annual profit of ₹6,530?

- A. ₹2,612
- B. ₹3,918
- C. ₹2,450
- D. ₹3,080



Q4 Mathematics

Simplify: $125 \div 25 \times 6 + [3 + (8 - 2)] \div 3$.

- A. 30
- B. 39
- C. 45
- D. 33



Q5 Mathematics

Simplify $\frac{2.46 \times 2.46 - 1.46 \times 1.46}{2.46 - 1.46}$, giving your answer as a fraction.

A. $\frac{392}{100}$



B. $\frac{392}{10000}$

C. $\frac{392}{1000}$

D. $\frac{392}{10}$

Q6 Mathematics

A 725 m long train passes through a 235 m long tunnel in 48 sec. Find the speed of the train.

A. 72 km/h



B. 82 km/h

C. 54 km/h

D. 66 km/h

Q7 Mathematics

If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2: 3, then the greater of the two angles is:

A. 54°

B. 108°



C. 120°

D. 136°

Q8 Mathematics

If the surface area of a sphere is $2124\frac{4}{7} \text{ cm}^2$, then what is the radius of that sphere? [Use $\pi = \frac{22}{7}$]

A. 14 cm

B. 13 cm



C. 12 cm

D. 11 cm



Q9 Mathematics

The average age of a family of father, mother and 2 children is 26 years. If the sum of the ages of the father and the children is 62 years, find the age of the mother.

- A. 26 years
- B. 30 years
- C. 42 years
- D. 45 years

**Q10 Mathematics**

Find the LCM of 84, 105 and 140.

- A. 420
- B. 240
- C. 360
- D. 120

**Q11 Mathematics**

A dishonest shopkeeper pretends to sell his goods at cost price, but uses a false weight on which 984 gm is written but which actually weighs much less. Using this false weight the shopkeeper actually makes a gain of 23%. Find the actual measure of the weight used.

- A. 800 gm
- B. 900 gm
- C. 850 gm
- D. 935 gm

**Q12 Mathematics**

Which of the following can be expressed in the form of a standard quadratic equation?

- A. $(2x + 3)^2 + 4x - 5 = (2x + 1)(2x - 3)$
- B. $\sqrt{2x^2 + 3x - 4} - 2x + 5 = 0$
- C. $(x + 1)(x + 2) = x^2 - 16$
- D. $(2x - 1)^3 = x^2 - 3x + 2$



Q13 Mathematics

The value of $\frac{\sin 16^\circ}{\cos 74^\circ} + \frac{\tan 14^\circ}{\cot 76^\circ} =$ is:

A. 0

B. 1

C. 2



D. 3

Q14 Mathematics

Two train engines of same length are running in the same direction with speeds of 18 km/h and 36 km/h. If the faster engine crosses the slower one in 8 sec, what is the length of each train engine?

A. 10 m

B. 20 m



C. 25 m

D. 30 m

Q15 Mathematics

Which of the following is reducible to a quadratic equation?

A.) $(m + 1) - \frac{1}{m + 1} = 65$

B.) $x^3 + 3x = 2x^3 - 4x^2$

C.) $(a + b)^2 = \frac{3}{b}$

D.) $x + (3x - 2) = \frac{1}{x^2} - 6$

A. A



B. B

C. C

D. D



Q16 Mathematics

The value of

$$(18 \div 9) \times (-7 + 9) - 7 \times 2 =$$

A. -10

B. -12

C. -6

D. -13

**Q17** Mathematics

The present age of a father is $1\frac{1}{2}$ times the sum of the present ages of his two sons. Six years hence, the ratio of his age to the sum of the ages of his sons will be 6 : 5. The present age of the father is:

A. 50 years

B. 45 years

C. 42 years

D. 36 years

**Q18** Mathematics

Ramu used to spend 72% of his income. His income is increased by 12% and he increases his expenditure by 5%. If

Ramu earlier saved ₹y and after the increases he now saves ₹x, then what is the value of $(\frac{x-y}{y} \times 100)\%$?

A. 22%

B. 25%

C. 27%

D. 30%



Q19 Mathematics

The table here gives the yield of wheat per hectare of 100 farmers of a village. What is the cumulative frequency of the class preceding the median class?

Production yield (Qui/Hec)	Number of farmers
30-40	5
40-50	18
50-60	15
60-70	22
70-80	27
80-90	13

A. 43

B. 38



C. 35

D. 29

Q20 Mathematics

The shopkeeper offers 3 successive discounts on a washing machine that costs ₹58,000, so that the price gets reduced to ₹42,000. If 5%, 10% and $x\%$ are the respective discounts, find the value of x .

A. 12

B. 15.3



C. 9

D. 10

Q21 Mathematics

If X is the greatest number that can divide 3808, 4798 and 5128 leaving the same remainder 13, then the sum of digits in X is:

A. 12



B. 14

C. 16

D. 18



Q22 Mathematics

There are two classrooms A and B having a certain number of students. If 5 students are shifted from A to B, then B has twice the number of students as A. If 1 student is sent from B to A, then both classrooms will have the same number of students. How many students are there in A?

A. 19

B. 26

C. 17



D. 22

Q23 Mathematics

Find the perimeter of a rhombus whose diagonals are of lengths 5 cm and 12 cm.

A. 20 cm

B. 26 cm



C. 25 cm

D. 24 cm

Q24 Mathematics

If $a + b = 27$ and $ab = 140$, then what is the value of $a^3 + b^3$?

A. 8343



B. 8433

C. 11340

D. 19683

Q25 Mathematics

The numerator of a fraction is one less than the denominator. If 6 is added to the numerator, the fraction will be equal to $\frac{5}{4}$. Find the fraction.

A. $-\frac{21}{20}$ B. $-\frac{20}{21}$ C. $\frac{20}{21}$ D. $\frac{19}{20}$ 

Mathematics

25 Questions · Answer Key

Q1 Mathematics HINDI - no English version saved

यदि $144 : b :: b : 36$ और $b > 0$ है, तो b का मान ज्ञात कीजिए।

A. 72



B. 12

C. 36

D. 27

Q2 Mathematics HINDI - no English version saved

सरल कीजिए: $\sqrt{\frac{1 + \cos A}{1 - \cos A}}$

A. $\sec A + \tan A$ B. $\sec A - \tan A$ C. $\operatorname{cosec} A + \cot A$ D. $\operatorname{cosec} A - \cot A$

Q3 Mathematics

Find the volume of a cylinder whose radius of base is 5 cm and height is 7 cm.

A. $517\pi \text{ cm}^3$ B. $715\pi \text{ cm}^3$ C. $175\pi \text{ cm}^3$ D. $157\pi \text{ cm}^3$ 

Q4 Mathematics HINDI - no English version saved

एक पुस्तक टाइप की जानी है। अकेले काम किए जाने पर, A इसे 15 दिन में टाइप करता है, B इसे 12 दिन में टाइप करता है, C इसे 20 दिन में टाइप करता है, और D इसे 8 दिन में टाइप करता है। यदि A और D एक साथ टीम SUN के रूप में कार्य करते हैं, B और C टीम MOON के रूप में कार्य करते हैं, तथा A और C टीम RED के रूप में कार्य करते हैं। कौन सी टीम सबसे कम समय में पुस्तक टाइपिंग का कार्य पूर्ण करेगी?

- A. टीम SUN
- B. टीम MOON
- C. टीम RED
- D. सभी टीमों को बराबर समय की आवश्यकता है

Q5 Mathematics HINDI - no English version saved

दो संख्याओं का योग 27 है। एक संख्या का पांच गुना, दूसरी संख्या के 4 गुने के बराबर है। इन दोनों संख्याओं में से छोटी संख्या ज्ञात कीजिए।

- A. 11
- B. 12
- C. 13
- D. 15

Q6 Mathematics HINDI - no English version saved

₹20,000 की राशि $7\frac{1}{2}\%$ वार्षिक चक्रवृद्धि ब्याज की दर पर 1 वर्ष 4 माह की अवधि के लिए निवेश की जाती है, जिस पर ब्याज की गणना वार्षिक चक्रवृद्धि आधार पर की जाती है। प्राप्त होने वाला चक्रवृद्धि ब्याज ज्ञात कीजिए।

- A. ₹2,037.50
- B. ₹2,171.25
- C. ₹2,185.75
- D. ₹2,210.40



Q7 Mathematics HINDI - no English version saved

एक दुकानदार 1 kg के स्थान पर 950 gm वजन के बाट का उपयोग करता है, और वस्तुओं को अंकित मूल्य पर बेचता है, जो क्रय मूल्य से 15% अधिक है। उसका प्रतिशत लाभ ज्ञात कीजिए।

A. $20\frac{5}{19}\%$

B. $23\frac{7}{19}\%$

C. $22\frac{3}{19}\%$

D. $21\frac{1}{19}\%$ ✓

Q8 Mathematics HINDI - no English version saved

एक कक्षा के दो सेक्शन A और B हैं, जिनमें विद्यार्थियों की संख्या क्रमशः 40 और 50 है। यदि सेक्शन A के विद्यार्थियों का औसत वजन 36 kg है, और सेक्शन B के विद्यार्थियों का औसत वजन 45 kg है, तो पूरी कक्षा का औसत वजन ज्ञात कीजिए।

A. 39 kg

B. 41 kg ✓

C. 43 kg

D. 42 kg

Q9 Mathematics HINDI - no English version saved

यदि 15 और -16 एक द्विघात समीकरण के मूल हैं, तो वह समीकरण _____ है।

A. $x^2 - 2x + 240 = 0$

B. $x^2 + x + 240 = 0$

C. $x^2 - x - 240 = 0$

D. $x^2 + x - 240 = 0$ ✓

Q10 Mathematics HINDI - no English version saved

7834 + 213 ÷ 3 - 51 का मान ज्ञात कीजिए।

A. 7834

B. 7854 ✓

C. 7884

D. 7885



Q11 Mathematics HINDI - no English version saved

यदि $x + \frac{1}{x} = 42$ है, तो $x^3 + \frac{1}{x^3}$ का मान ज्ञात कीजिए।

A. 74,926

B. 73,962



C. 72,629

D. 74,130

Q12 Mathematics HINDI - no English version saved

यदि $49 : x :: x : 81$ और $64 : y :: y : 169$ है, जहां x और y दोनों प्राकृत संख्याएं हैं, तो $2x + 3y$ का मान ज्ञात कीजिए।

A. 348

B. 438



C. 312

D. 126

Q13 Mathematics HINDI - no English version saved

एक कक्षा के 35 विद्यार्थियों की औसत आयु 15 वर्ष है। जब शिक्षक की आयु को भी शामिल कर लिया जाता है, तो औसत आयु एक वर्ष बढ़ जाती है। शिक्षक की आयु ज्ञात कीजिए।

A. 35 वर्ष

B. 41 वर्ष

C. 45 वर्ष

D. 51 वर्ष



Q14 Mathematics HINDI - no English version saved

$(3, -2), (2, -3)$ और $(p, -4)$ शीर्षों वाले एक त्रिभुज का क्षेत्रफल 8 वर्ग इकाई है। p का मान ज्ञात कीजिए।

A. -15

B. -16

C. 15

D. 17



Q15 Mathematics HINDI - no English version saved

एक व्यक्ति अपने बगीचे में 21,025 आम के पेड़ इस प्रकार लगाता है, कि पंक्तियों की संख्या, प्रत्येक पंक्ति में पेड़ों की संख्या के बराबर है। पंक्तियों की संख्या ज्ञात कीजिए।

A. 125

B. 135

C. 145



D. 130

Q16 Mathematics HINDI - no English version saved

निम्न में से कौन सा वह द्विघात समीकरण है, जिसके मूल $2 + \sqrt{3}$ और $4 - 2\sqrt{3}$ हैं?

A. $2x^2 - (6 - \sqrt{3})x + 2 = 0$

B. $3x^2 - (6 - \sqrt{3})x + 4 = 0$

C. $x^2 - (12 - \sqrt{3})x + 2 = 0$

D. $x^2 - (6 - \sqrt{3})x + 2 = 0$



Q17 Mathematics HINDI - no English version saved

एक संख्या को दो भागों में इस प्रकार विभाजित किया जाता है कि संख्या का एक भाग दूसरे भाग से 10 अधिक है, और दोनों भागों का अनुपात 4 : 3 होता है। प्रारंभिक संख्या ज्ञात कीजिए।

A. 30

B. 40

C. 70



D. 80



किसी संख्या को एक भाजक से विभाजित करने पर 16 शेष बचता है। जब मूल संख्या के दोगुने को उसी भाजक से विभाजित किया जाता है, तो 3 शेष बचता है। उस भाजक का मान ज्ञात कीजिए।

A. 29



B. 23

C. 53

D. 51

दो संख्याओं के लघुत्तम समापवर्त्य (LCM) और महत्तम समापवर्तक (HCF) क्रमशः 1920 और 4 हैं। यदि एक संख्या 60 है, तो दूसरी संख्या _____ है।

A. 128



B. 140

C. 130

D. 117

यदि एक व्यक्ति एक निश्चित दूरी को 5 km/h की चाल से तय करने में 36 मिनट का समय लेता है, तो उसके द्वारा तय की गई दूरी ज्ञात करें।

A. 2.5 km

B. 2 km

C. 3 km



D. 3.5 km

$\frac{0.5 \times 10.6 - 0.2 \times 1.4}{0.4}$ का मान ज्ञात कीजिए।

A. 12.25

B. 12.55



C. 1.255

D. 125.5



Q22 Mathematics

A pair of parallel lines is intersected by a transversal such that $\angle 1$ and $\angle 2$ form a pair of alternate interior angles. If $m\angle 1 = 35^\circ$, what is the measure of $\angle 2$?

A. 145° B. 55° C. 35° ✓D. 65° **Q23 Mathematics** HINDI - no English version saved

राधा और रमा की आयु का अंतर 6 वर्ष है, और उनकी आयु का योग 26 है। राधा की आयु ज्ञात कीजिए, यदि वह रमा से बड़ी है।

A. 6 वर्ष

B. 16 वर्ष ✓

C. 26 वर्ष

D. 32 वर्ष

Q24 Mathematics HINDI - no English version saved

10%, 15% और 20% की क्रमिक छूटों के तुल्य एकल छूट ज्ञात कीजिए।

A. 40%

B. 45%

C. 38.8% ✓

D. 36.6%

Q25 Mathematics

If the ratio of two interior angles on the same side of a transversal line intersecting the two parallel lines is 3 : 7, then what is the positive difference between the measures of these two interior angles?

A. 54° B. 64° C. 72° ✓D. 80° 

Mathematics

25 Questions · Answer Key

Q1 Mathematics

Find the volume of a sphere whose diameter is 42 m.

A. $38,808 \text{ m}^3$ B. $23,437 \text{ m}^3$ C. $13,416 \text{ m}^3$ D. $42,137 \text{ m}^3$

Q2 Mathematics

Aditya and Bhaskar undertake to do a piece of work for ₹15,000. Aditya alone can do it in 15 days while Bhaskar alone can do it in 18 days. With the help of Chandra, they finish it in 6 days. What is Chandra's share?

A. ₹4,000



B. ₹5,000

C. ₹6,000

D. ₹7,000

Q3 Mathematics

Two trains start from P and Q, respectively, at the same time and run towards each other at a speed of 40 km/h and 30 km/h, respectively. By the time they meet, the first train has covered 80 km more than the other train. Find the distance between P and Q.

A. 560 km



B. 630 km

C. 660 km

D. 240 km

Q4 Mathematics

If 7, 12, 21 and x are in proportion, the value of x is:

A. 27

B. 35

C. 24

D. 36



Q5 Mathematics

If X represents the smallest prime number multiplied by 4 and added to the least common multiple of 5 and 10; Y represents the smallest odd prime number multiplied by 5 and added to the 2nd smallest odd prime, then which of the following is true?

- A. X is greater than Y.
- B. $X + Y = 10$.
- C. X and Y are equal.
- D. The difference of Y and X is 2.

**Q6 Mathematics**

The owner loses 20% when he sells a plot for ₹19,50,000. At what price must he sell the plot in order to gain a profit of 20%?

- A. ₹21,00,000
- B. ₹22,50,000
- C. ₹25,95,000
- D. ₹29,25,000

**Q7 Mathematics**

If the HCF and LCM of two numbers are 7 and 245, respectively, then their product is:

- A. 1715
- B. 1517
- C. 1175
- D. 1751

**Q8 Mathematics**

The average of ten numbers is 8. If each number is divided by 2, then find the average of the new set of numbers.

- A. 8
- B. 6
- C. 4
- D. 10



Q9 Mathematics

If the volume of a cylinder is $256\pi \text{ cm}^3$ and the radius of its base is 8 cm, then find the height of the cylinder.

A. 3 cm

B. 4 cm



C. 5 cm

D. 6 cm

Q10 Mathematics

A trader owes a merchant ₹10,500 due in one year. The trader wants to settle the account after four months. If the rate of interest is 6% per annum, then how much should he pay (rounded off value)?

A. ₹ 11,096

B. ₹ 10,069

C. ₹ 11,069

D. ₹ 10,096



Q11 Mathematics

The value of $\tan \theta + \frac{1}{\tan \theta}$ is:

A. $\cos \theta \sec \theta$

B. $\operatorname{cosec} \theta \sec \theta$



C. $\operatorname{cosec} \theta \sin \theta$

D. $\operatorname{cosec} \theta \cot \theta$

Q12 Mathematics

The value of $\sqrt{1.0201} =$

A. 10.1

B. 1.01



C. 1.02

D. 101



Q13 Mathematics

One-third of a certain distance was covered by a car at a speed of 30 km/h and the remaining distance was covered by the car at 20 km/h. How much distance was covered by the car in 4 hours?

A. 30 km

B. 60 km

C. 90 km



D. 95 km

Q14 Mathematics

Simplify: $x^3 - 3x^2 + 9x - 12 - x^3 - 7x^2 - 8x - 16$.

A. $10x^2 - x - 28$ B. $-10x^2 + x + 28$ C. $10x^2 + x - 28$ D. $-10x^2 + x - 28$ **Q15** Mathematics

Find the sum of the roots of $\sqrt{2}x^2 - 2\sqrt{5}x + \sqrt{3} = 0$.

A. $-2\sqrt{5}$ B. $\sqrt{10}$ C. $5\sqrt{2}$ D. $-\sqrt{10}$ **Q16** Mathematics

Which of the following is NOT a property of similar triangles?

A. Ratio of areas of two similar triangles = Ratio of squares of corresponding altitudes

B. Ratio of areas of two similar triangles = Ratio of squares of corresponding medians

C. Ratio of areas of two similar triangles = Ratio of squares of corresponding segments obtained by corresponding angle bisectors.

D. Ratio of areas of two similar triangles = Ratio of corresponding segments obtained by corresponding angle bisectors.



Q17 Mathematics

For which positive value of b does the equation $x^2 + bx + 9 = 0$ have equal roots?

A. 2

B. 3

C. 4

D. 6



Q18 Mathematics

Geetha, Latha and Madhuri's ages are in the ratio 5 : 6 : 3. If their average age is 42 years, then find Latha's age.

A. 35 years

B. 27 years

C. 45 years

D. 54 years



Q19 Mathematics

In a parallelogram PQRS, the bisectors of consecutive angles of P and Q intersect at T. What is the measure of $\angle PTQ$?

A. 50°

B. 80°

C. 70°

D. 90°



Q20 Mathematics

$\frac{a^{10} \times b^{-7} \times c^{-4}}{a^{-5} \times b^2 \times c^5}$ in simplified form is:

A. $a^{15} \times b^{-9} \times c^{-9}$

B. $a^{15} \times b^9 \times c^9$

C. $a^5 \times b^9 \times c^{-9}$

D. $a^5 \times b^{-9} \times c^{-9}$



Q21 Mathematics

The value of 121.12×0.121 is:

- A. 146.5552
- B. 1.465552
- C. 14.65552
- D. 1465.552

**Q22** Mathematics

A vessel is one-fourth full of water. After adding 10 cups of water to it, the vessel gets three-fourth full. Find the capacity of the vessel in cups.

- A. 20
- B. 22
- C. 25
- D. 27

**Q23** Mathematics

The marked price of an article is ₹1,200. The shopkeeper offered two successive discounts of 10% and 5% respectively to a customer. At what price did the customer purchase the article?

- A. ₹1,062
- B. ₹1,206
- C. ₹1,026
- D. ₹1,602

**Q24** Mathematics

Find Compound Interest on ₹11,000 in 2 years at 4% p.a., interest compounded yearly.

- A. ₹906.50
- B. ₹786.60
- C. ₹897.60
- D. ₹875.80



Q25 Mathematics

For what value of k do the pair of linear equations $2x + 3y - 1 = 0$ and $4x + ky + 2 = 0$ have no solution?

A. 6



B. 5

C. 4

D. 3



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Rani stitches a gown in 3 hours while Padma stitches an identical gown in 2 hours. Each of them works for 6 hours per day. If they have a bulk order of 52 such gowns to stitch, in how many days will they complete the task if they work on alternate days, starting with Rani?

A. 10 days

B. 11 days

C. 20 days

D. 21 days



Q2 Mathematics

Which of the following quadratic equations satisfies that the roots are 3 and -2?

A. $x^2 - x + 6 = 0$ B. $x^2 + x - 6 = 0$ C. $x^2 + x + 6 = 0$ D. $x^2 - x - 6 = 0$ 

Q3 Mathematics

If John travels a distance of 90 km at a speed of 30 km/h and returns at a speed of 60 km/h, his average speed is:

A. 30 km/h

B. 40 km/h

C. 45 km/h

D. 60 km/h



Q4 Mathematics

Find the LCM of 24, 42 and 56.

A. 618

B. 186

C. 168

D. 816



Q5 Mathematics

Simplify $\frac{5^3 \times 27 \times 10^3}{5^6 \times 3^2 \times 4}$

A. 8

B. $\frac{3}{2}$ C. $\frac{1}{2}$

D. 6 ✓

Q6 Mathematics

The sum of the ages of Sarala and Kishore is 26 years. If 3 years ago, Kishore was $\frac{3}{2}$ times as old as the Sarala, then the present age of the Sarala is:

A. 9 years

B. 10 years

C. 11 years ✓

D. 12 years

Q7 Mathematics

The roots of $(x - 5)^2 = 5x + 11$ are ____

A. 3 and 12

B. 5 and 7

C. 1 and 14 ✓

D. 2 and -13

Q8 Mathematics

Simplify: $3(9x^3 - 6x^2 + 30) - 9(3x^3 - 2x + 30)$.

A. $18(x^2 + x + 10)$ B. $18(x^2 + x - 18)$ C. $18(x^2 + x - 10)$ D. $-18(x^2 - x + 10)$ ✓

Q9 Mathematics

If the diameter and the height of a cylinder are 12 cm and 10.5 cm, respectively, then using $\pi = \frac{22}{7}$, find the volume of the cylinder.

A. 1281 cm^3 B. 1313 cm^3 C. 1288 cm^3 D. 1188 cm^3 ✓**Q10** Mathematics

Seven times a number reduced by 14 is equal to the sum of 5 times the number and 6. Find the number.

A. 20

B. 10 ✓

C. 15

D. 5

Q11 Mathematics

Find the value of x , if $6^{x+4} = 6^7$.

A. 2

B. 3 ✓

C. 4

D. 5

Q12 Mathematics

Arun borrowed a sum of ₹9,000 from Jayanthi at 10% rate of compound interest per annum, compounded annually. Find the total amount paid by Arun after 2 years to clear all dues.

A. ₹10,890 ✓

B. ₹10,980

C. ₹10,089

D. ₹10,098



Q13 Mathematics

8 men and 6 women can complete a piece of work in 5 days while 6 men and 8 women can also complete the same work in 5 days. In how many days will 7 men and 7 women complete the same work?

A. 2 days

B. 3 days

C. 6 days

D. 5 days ☒**Q14** Mathematics

The value of

$$\left(-\frac{5}{3}\right) \times \left(\frac{9}{25}\right) + \left(\frac{1}{5} - 2\right) =$$

A. $-\frac{12}{5}$ ☒B. $\frac{9}{5}$ C. $-\frac{4}{5}$

D. 0

Q15 Mathematics

Two numbers are in the ratio 5 : 8. If the first number increases by 40% and second number decreases by 15%, the new ratio becomes _____

A. 12 : 17

B. 37 : 39

C. 23 : 26

D. 35 : 34 ☒

Q16 Mathematics

Find the capacity of a spherical container of thickness 2 cm and external radius 9 cm. (Rounded off to 2 decimal places.)

(Use $\pi = \frac{22}{7}$.)

- A. 1590.48 cm³
- B. 1050.67 cm³
- C. 1241.14 cm³
- D. 1437.33 cm³ ✓

Q17 Mathematics

If the manufacturer gains 12%, the wholesale dealer gains 15% and the retailer gains 20%, then find the cost of production of a table, the retail price of which is ₹15,456.

- A. ₹10,000 ✓
- B. ₹12,000
- C. ₹15,000
- D. ₹20,000

Q18 Mathematics

There are two sets of data A and B. The mean of both sets is same. The median of data B is twice the median of data A. The relation between the modes of sets A and B is

- A. Mode B – Mode A = 3 median A ✓
- B. Mode B + Mode A = 3 median A
- C. Mode B – Mode A = $(\frac{3}{2})$ median A
- D. Mode B – Mode A = $(\frac{3}{4})$ median A

Q19 Mathematics

Which of the following is RHS of the equation

$$\frac{\sin^2 A}{1 - \cos A} =$$

- A. $\cos A + 1$ ✓
- B. $\tan A$
- C. $\operatorname{cosec} A$
- D. $\sec A + \tan A$



Q20 Mathematics

In triangle ABC, if the angles are in the ratio 4 : 3 : 5, find the angles.

- A. $20^\circ, 50^\circ, 70^\circ$
- B. $20^\circ, 15^\circ, 25^\circ$
- C. $40^\circ, 30^\circ, 50^\circ$
- D. $60^\circ, 45^\circ, 75^\circ$ ✓

Q21 Mathematics

X placed an order for 20 shirts marked for ₹750 each. The shopkeeper offered 20% discount on purchase of 20 shirts. He allowed a further discount of ₹500, as the payment was made in cash. Find the final selling price of each shirt, if the selling price of each shirt is the same?

- A. ₹650
- B. ₹625
- C. ₹575 ✓
- D. ₹550

Q22 Mathematics

If $18\% \text{ of } 200 = x$, then $x = ?$

- A. 36 ✓
- B. 63
- C. 72
- D. 27

Q23 Mathematics

The sum of a two-digit number and the number obtained by reversing the digits is 99. If the digits of the number differ by 5, then the two-digit number can be:

- A. 27 ✓
- B. 18
- C. 83
- D. 16



Q24 Mathematics

The product of the LCM and HCF of two numbers is 48. If the two numbers differ by 13, then find the numbers.

A. 3 and 16



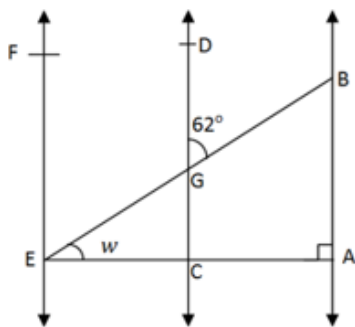
B. 4 and 17

C. 11 and 24

D. 12 and 25

Q25 Mathematics

In the adjoining figure $AB \parallel CD$ and $CD \parallel EF$. Also, $EA \perp AB$. If $\angle BGD = 62^\circ$, then the value of w is:



A. 118°

B. 28°



C. 62°

D. 108°



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Simplify $2^3 \times 3^2 \times 7$.

A. 603

B. 506

C. 702

D. 504



Q2 Mathematics

If twice the son's age is added to the father's age, the sum is 34 years. If 1.5 times the father's age is added to the son's age, the sum is 45 years. What is the father's age (in years)?

A. 26

B. 28

C. 30

D. 32



Q3 Mathematics

Three times the present age of Sujatha is 5 years more than two times the present age of Vanita. After 3 years, three times the age of Vanita will be 4 years less than four times the age of Sujatha. The age of Vanita is k years more than that of Sujatha. What is the value of k ?

A. 3

B. 4

C. 7

D. 9



Q4 Mathematics

A train P going at the speed of 70 km/h completely passes train Q of length 170 m, going in the same direction on parallel tracks, at 56 km/h, in $1\frac{1}{2}$ minutes. How much time (in seconds) will P take to cross completely train R of length 220 m, going at 74 km/h in the opposite direction?

A. 10

B. 12

C. 14

D. 15



Q5 Mathematics

Find the nature of roots of $2(p + q)^2x^2 + 2(p + q)x + 1 = 0$

- A. Real roots
- B. Real and equal roots
- C. Real and distinct roots
- D. Imaginary roots

**Q6 Mathematics**

Five solid cubes, each of volume 216 cm^3 , are joined end to end in a linear manner only (single row arrangement) to form a cuboid. What is the lateral surface area (in cm^2) of the cuboid?

- A. 360
- B. 432
- C. 468
- D. 504

**Q7 Mathematics**

An article is marked 50% above its cost price. If the shopkeeper gives two successive discounts of 10% and 25%, and still earns a profit of ₹15, then the cost price of the article is:

- A. ₹1,200
- B. ₹1,750
- C. ₹1,600
- D. ₹1,500

**Q8 Mathematics**

The sum of a number, its half, its $\frac{1}{3}$ and 27, is 71. Find the number.

- A. 22
- B. 23
- C. 24
- D. 25



Q9 Mathematics

The area of a square is 900 cm^2 . Its perimeter is equal to the perimeter of a regular hexagon. What is the area (in cm^2) of the hexagon?

A. 300

B. $400\sqrt{3}$

C. $600\sqrt{3}$ ✓

D. 600

Q10 Mathematics

Two successive discounts of 40% and 60% on a deal are equivalent to a single discount of:

A. 80%

B. 76% ✓

C. 70%

D. 66%

Q11 Mathematics

The monthly wages of 6 employees in a company are ₹5,000, ₹6,000, ₹8,000, ₹8,500, ₹9,300, and ₹9,500. Find the median of their wages.

A. ₹8,000

B. ₹8,250 ✓

C. ₹8,500

D. ₹8,750

Q12 Mathematics

The third proportional of $(a + b)$ and $(a + b)^2$ is

A. $(a + b)$

B. b

C. a

D. $(a + b)^3$ ✓



Q13 Mathematics

A line joining two end points is called a/an:

A. line segment



B. ray

C. parallel line

D. intersecting line

Q14 Mathematics

P is any point inside the rectangle ABCD. If $PA = 27$ cm, $PB = 21$ cm, $PC = 6$ cm, then the length PD (in cm) is equal to:

A. 10

B. 12

C. 15

D. 18



Q15 Mathematics

Sankar and Vishnu work alternately in a tailoring shop on an order of stitching 21 suits. Sankar starts the work, stitches 3 suits in two days, and takes a break, during which Vishnu stitches 3 suits in three days, and then takes a break. This pattern is repeated till all the 21 suits are stitched. How many days did it take the duo to complete the work?

A. 15 days

B. 16 days

C. 17 days



D. 18 days

Q16 Mathematics

Three numbers are in the ratio 1: 2: 5 and their LCM is 1600. Find the HCF of the numbers.

A. 800

B. 480

C. 320

D. 160



Q17 Mathematics

If $x + \frac{1}{x} = 3$, then

$x^2 + \frac{1}{x^2}$ is:

A. 9

B. 8

C. 7



D. 6

Q18 Mathematics

One pipe can fill the tank in 20 min while another pipe can empty it in 60 min. If both the pipes are operated together, how long will it take to fill the tank completely?

A. 20 min

B. 30 min



C. 40 min

D. 10 min

Q19 Mathematics

Raghav's average earning per month in the first three months of a year was ₹45,000. In April, his earning was $33\frac{1}{3}\%$ more than the average earning in the first three months. If his average earning per month for the whole year is ₹45,300, then what will be Raghav's average earning (in ₹) per month from May to December?

A. 43,425

B. 43,450

C. 43,575



D. 43,580

Q20 Mathematics

If $x = -1$ and $x = -2$ are the solutions of the quadratic equation $3x^2 + px + q = 0$, then what is the value of $(3p - 2q)$?

A. 12

B. 13

C. 15



D. 17



Q21 Mathematics

In what ratio should sugar costing ₹45 per kg be mixed with sugar costing ₹52 per kg so that by selling the mixture at ₹55.20 per kg, there is a profit of 15%?

A. 3 : 2

B. 4 : 3



C. 5 : 4

D. 2 : 1

Q22 Mathematics

Three numbers $x \leq y \leq z$ which are co-prime to each other are such that the product of the first two numbers is 143 and that of the last two numbers is 195. The sum of the three numbers is _____

A. 29

B. 39



C. 45

D. 62

Q23 Mathematics

The simple interest on a sum of ₹3,600 for 3 years and 4 months is ₹840. The rate of interest per annum is:

A. 9%

B. 8%

C. 7%



D. 6%

Q24 Mathematics

Find the smallest number that can be added to 467851 to make the sum a perfect square.

A. 6

B. 5



C. 4

D. 3



If $\sec \theta = \frac{5}{3}$, and θ is an acute angle, then the value of $\frac{3 \tan \theta - 5 \cos \theta}{5 \sin \theta - 3 \sec \theta} = ?$

A. 0

B. 1

C. -1



D. 4



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A shopkeeper has the following 3 schemes:

(I) Two successive discounts of 30% and 35%

(II) Buy 6, get 4 free

(III) Buy 5, get 6 free

Which scheme has the maximum discount percentage?

A. Only I

B. Only II

C. Only III



D. Both II and III

Q2 Mathematics

If the product of two numbers, not necessarily distinct from each other, is 25 and their HCF is 5, then their LCM is:

A. 4

B. 5



C. 6

D. 7

Q3 Mathematics

Find the area of a trapezium (in sq. unit) with parallel sides of length 3 unit and 5 unit and the shortest distance between its parallel sides is 6 unit.

A. 24



B. 12

C. 48

D. 15



Q4 Mathematics

Which is the correct formula for median of grouped data?

Consider:

L = lower limit of median class

CF_0 = cumulative frequency of preceding class

F = frequency of median class

H = class width

N = the total of frequency

A. $L + \frac{N}{2} - CF_0 - F \times H$

B. $L + \frac{\frac{N}{2} - CF_0}{F} \times H$



C. $\frac{\frac{N}{2} - CF_0}{F} \times H$

D. $L + \frac{\frac{N}{2} - CF_0}{F}$

Q5 Mathematics

The sum of two positive numbers is 45 and their difference is 19. What are the numbers?

A. 25, 20

B. 32, 13



C. 31, 15

D. 30, 15



Q6 Mathematics

If α and β are the roots of the equation $6x^2 + x - 15 = 0$, where $\alpha > \beta$, then the value of $(\alpha - \beta)$ is:

- A. $\frac{1}{6}$
- B. $\frac{1}{3}$
- C. $\frac{20}{3}$
- D. $\frac{19}{6}$

**Q7 Mathematics**

A 280 m long train overtakes a man moving at a speed of 8 km/h (in same direction) in 16 seconds. How much time (in seconds) will it take this train to completely cross another 380 m long train, moving in the opposite direction at a speed of 37 km/h?

- A. 20
- B. 22
- C. 25
- D. 28

**Q8 Mathematics**

In $\triangle ABC$, $DE \parallel AC$, where D and E are the points on sides AB and BC, respectively. If $BD = 4$ cm and $AD = 2\sqrt{2}$ cm, then what is the ratio of the area of $\triangle BDE$ to the trapezium ADEC?

- A. $2 : (1 + 3\sqrt{2})$
- B. $1 : (1 + 2\sqrt{2})$
- C. $2 : (1 + \sqrt{2})$
- D. $2 : (1 + 2\sqrt{2})$

**Q9 Mathematics**

If an exterior angle of a regular polygon is 40° , then the number of sides in the regular polygon is:

- A. 10
- B. 9
- C. 8
- D. 7



Q10 Mathematics

If $9.6 : 16.8 :: 18 : x$, what is the value of x ?

- A. 20.4
- B. 24.8
- C. 25.5
- D. 31.5



Q11 Mathematics

The cost of 2 tables and 3 chairs is ₹540, while that of 2 tables and 1 chair is ₹470. What is the cost of 5 chairs?

- A. ₹185
- B. ₹245
- C. ₹175
- D. ₹205



Q12 Mathematics

If $(\sin\beta + \operatorname{cosec}\beta)^2 + (\sec\beta - \cos\beta)^2 = a + \tan^2\beta + \cot^2\beta$, then the value of a is:

- A. 0
- B. 2
- C. 3
- D. 5



Q13 Mathematics

Find the value of $529 \div 23 \times 61 - 1403$.

- A. 1
- B. 2
- C. 0
- D. 3



Q14 Mathematics

If the ratio of two numbers is 4 : 3 and the product of their LCM and their HCF is 432, then the sum of the reciprocals of the LCM and the HCF is:

A. $\frac{13}{72}$



B. $\frac{13}{2}$

C. $\frac{13}{7}$

D. $\frac{13}{27}$

Q15 Mathematics

A dealer buys apples at ₹50, ₹40 and ₹30 per kilogram. He mixes them in the ratio 2 : 4 : 9 respectively, by weight, and sells at a profit of 30%. At what approximate price per kilogram does he sell the apples?

A. ₹45.9/kg



B. ₹23.5/kg

C. ₹10.8/kg

D. ₹75/kg

Q16 Mathematics

The sum of two times the present age of A and three times the present age of B is 106 years. Four times the present age of B exceeds three times the present age of A by 11 years. What will be the sum of the ages (in years) of A and B, 4 years from now?

A. 43

B. 47

C. 49

D. 51

**Q17 Mathematics**

A man covers distances of 300 km, 225 km, and 375 km at the speed of 15 km/h, x km/h and 30 km/h, respectively. If his average speed for the whole journey is 20 km/h, then what is the value of x ?

A. 15

B. 18



C. 20

D. 24



Q18 Mathematics

The simplified value of $\frac{(0.11)^2 + (0.06)^2 + (0.031)^2}{(0.011)^2 + (0.006)^2 + (0.0031)^2}$ is:

A. 1000

B. 100

C. 10

D. 1



Q19 Mathematics

If $x^2 - 4x + 4 = 0$, then the value of $x^3 + x^2 + \frac{1}{x} + \frac{1}{x^2}$ is:

A. 15.75

B. 14.75

C. 13.75

D. 12.75



Q20 Mathematics

If $x^2 - 2x + 1 = 0$, then it has:

A. two roots

B. three roots

C. four roots

D. five roots



Q21 Mathematics

Krishna has a few coins of 1 rupee, 50 paise and 25 paise in the ratio $\frac{1}{4} : \frac{1}{2} : \frac{1}{2}$. If the number of 25 paise coins is 100, then the total amount with Krishna is:

A. ₹ 75

B. ₹ 120

C. ₹ 100

D. ₹ 125



Q22 Mathematics

A car covers certain distance in $2\frac{1}{4}$ hours at 36 miles/h and another distance in $1\frac{3}{4}$ hours at 56 miles/h. Find the total distance (in miles) travelled by the car.

A. 139

B. 159

C. 179



D. 200

Q23 Mathematics

A sum of ₹36,000 deposited at a certain rate of compound interest, compounded annually, becomes three times itself after 6 years. How much will it become after 18 years at the same rate of compound interest?

A. ₹10,72,000

B. ₹9,72,000



C. ₹8,72,000

D. ₹7,72,000

Q24 Mathematics

There are 4 pipes attached to a tank. Two to fill the tank and the other two to transfer the water into a cistern. The first two pipes can fill the tank in 40 sec and 80 sec, respectively, when opened alone, while the last two can empty in 80 sec and 160 sec, respectively, when opened alone. If all the pipes are opened together, in how much time will the tank be filled?

A. 21.2 sec

B. 24.44 sec

C. 53.33 sec



D. 16.8 sec

Q25 Mathematics

The sides of a triangle are 15 cm, 28 cm, and 41 cm. What is the length of its altitude corresponding to the side with a length of 28 cm?

A. 9 cm



B. 10 cm

C. 12 cm

D. 14 cm



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The sum of two consecutive multiples of 6 is 66. Find the smaller of these two multiples.

- A. 24
- B. 42
- C. 36
- D. 30



Q2 Mathematics

Two numbers are in the ratio 2 : 7. If the first number is increased by 14 and the second number is decreased by 6, then the ratio becomes 4 : 3. What is the sum of the original two numbers?

- A. 18
- B. 27
- C. 36
- D. 45



Q3 Mathematics

A trader gives 5% discount on the marked price of an article and gives 2 articles free for buying 14 articles and gains 33% in the entire transaction. Assuming a customer pays for 14 articles, the marked price of an article is what per cent more than its cost price?

- A. 48%
- B. 50%
- C. 55%
- D. 60%



Q4 Mathematics

If the length of a rectangle is thrice its breadth and the perimeter of that rectangle is 48 cm, then find its breadth.

- A. 4 cm
- B. 6 cm
- C. 8 cm
- D. 9 cm



Q5 Mathematics

The total surface area of a solid cylinder having radius 24 cm and height 6 cm is:

A. $4440 \pi \text{ cm}^2$

B. $3440 \pi \text{ cm}^2$

C. $2440 \pi \text{ cm}^2$

D. $1440 \pi \text{ cm}^2$ ✓

Q6 Mathematics

A train travelling at a speed of 45 km/h crosses a pole in 24 sec. What is the length of the train?

A. 125 m

B. 30 m

C. 1.5 m

D. 300 m ✓

Q7 Mathematics

Simplify the given expression.

$$(13^2 - 5^2)^{\frac{3}{2}} \times 8^{\frac{2}{3}} \div \left(\frac{1}{6}\right)^{-3}$$

A. 32 ✓

B. 24

C. 16

D. 12

Q8 Mathematics

The mean and the mode of a set of data are 58.7 and 61.1, respectively. Find the median of the data, using the empirical formula.

A. 54.6

B. 55.2

C. 55.8

D. 59.5 ✓



Q9 Mathematics

A shopkeeper marks an article at ₹ x and offers a discount of 20% on it. He sells it for ₹432 after charging VAT of 12.5% on the discounted price. What is the value of ₹ x ?

A. ₹450

B. ₹480



C. ₹500

D. ₹520

Q10 Mathematics

A retailer permits a trade discount of 25% followed by a cash discount of 8% on the already discounted price of his goods, and still makes a net gain of 17.3% of the cost price. At what percentage above the cost price of the goods is the marked price fixed?

A. 50%

B. 60%

C. 70%



D. 75%

Q11 Mathematics

The cost of 12 pens and 7 pencils is ₹233. If the cost of a pen decreases by ₹1.50 and the cost of a pencil increases by ₹1, then the cost of 2 pens and 3 pencils is ₹48. What is the original cost of 4 pens and 1 pencil?

A. ₹71



B. ₹77

C. ₹74

D. ₹78

Q12 Mathematics

The positive square root of $(34^2 - 16^2)$ is:

A. 60

B. 50

C. 40

D. 30



Q13 Mathematics

If angles A, B, C and D of a quadrilateral ABCD, taken in order, are in the ratio 3: 7: 6: 4, then ABCD is a:

- A. parallelogram
- B. trapezium
- C. rhombus
- D. kite

Q14 Mathematics

The sides (in cm) of a right triangle are $(x - 2)$, $(x - 4)$ and x . Its area (in cm^2) is:

- A. 12
- B. 24
- C. 40
- D. 60

Q15 Mathematics

In $\triangle ABC$, $BD \perp AC$ at D and $\angle DBC = 44^\circ$. E is a point on BC such that $\angle CAE = 34^\circ$. What is the measure of $\angle AEB$?

- A. 56°
- B. 46°
- C. 80°
- D. 78°

Q16 Mathematics

What is the value of $(2x + 3y)$, if mean of the following distribution is 54?

Class	0-20	20-40	40-60	60-80	80-100	Total
Frequency	7	11	x	9	y	50

- A. 59
- B. 57
- C. 56
- D. 69



Q17 Mathematics

Which of the following quadratic equations has one of its roots as $4 - 2\sqrt{5}$?

A. $x^2 - 8x - 4 = 0$



B. $x^2 - 8x + 4 = 0$

C. $x^2 - 4x - 8 = 0$

D. $x^2 - 4x + 4 = 0$

Q18 Mathematics

Express $0.\overline{74} + 0.\overline{876}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $1\frac{676}{990}$

B. $1\frac{15}{22}$

C. $1\frac{37}{55}$

D. $1\frac{133}{198}$



Q19 Mathematics

Find the greatest number by which when the numbers 158 and 215 are divided, it leaves remainders 4 and 5, respectively.

A. 14



B. 18

C. 21

D. 7

Q20 Mathematics

Find the area (in square units) of a triangle with vertices $(3, 4)$, $(5, 7)$ and $(-3, 6)$.

A. 2

B. 11



C. 1

D. 5



Q21 Mathematics

A can do a piece of work in 15 days and B can do the same work in 20 days. The time taken by them working together to do the same work is:

A. $10\frac{4}{7}$ days

B. $9\frac{4}{7}$ days

C. $8\frac{4}{7}$ days



D. $7\frac{4}{7}$ days

Q22 Mathematics

The sum of two numbers is 35 and their LCM is 306. The two numbers are:

A. 16, 19

B. 17, 18



C. 14, 21

D. 13, 22

Q23 Mathematics

If the simple interest on ₹4,800 at 15% per annum for 'n' years is ₹2,160, then find the value of 'n'.

A. 5

B. 6

C. 4

D. 3

**Q24 Mathematics**

If $x = (\sec \theta - \cos \theta)(\cot \theta + \tan \theta)$ and $y = \sec \theta(\sec \theta + \tan \theta)(1 - \sin \theta)$, $0^\circ < \theta < 90^\circ$, then xy is equal to:

A. $\cot \theta$

B. $\tan \theta \sec \theta$



C. $\operatorname{cosec} \theta \cot \theta$

D. $\sin \theta$



Q25 Mathematics

In a mixture of 80 litres, the ratio of milk to water is 3: 1. If this ratio is to be 2: 3, then the quantity of water to be further added is:

A. 70 litres



B. 30 litres

C. 20 litres

D. 50 litres



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The expression $\frac{1+x}{1-x} - \frac{1-x}{1+x} + \frac{4x}{1+x^2} + \frac{8x^3}{1-x^4}$ is equal to:

A. $\frac{8x}{1-x^2}$



B. $\frac{4x}{1+x^2}$

C. $\frac{4x}{1-x^2}$

D. $\frac{8x}{1+x^2}$

Q2 Mathematics

A man sold a shirt for ₹960, at a loss of 4%. He sells a sweater for ₹840 at a profit of 20%. Find his net profit or loss.

A. Profit, ₹123

B. Loss, ₹100

C. Loss, ₹123

D. Profit, ₹100



Q3 Mathematics

Find the values of b for which the quadratic equation $4x^2 + bx + 1 = 0$ has equal roots.

A. -4 and 4



B. Only 4

C. Only -4

D. -8 and 8



Q4 Mathematics

Harish bought an article for ₹520 and sold it to Renu at a loss of 30%. With this amount, Harish bought another article and sold it at a gain of 55%. What is Harish's overall gain percentage?

A. 8.5%



B. 7.8%

C. 9%

D. 9.5%

Q5 Mathematics

Amita travels a certain distance at a speed of 50 km/h and double the earlier distance at 60 km/h. She then returns to the starting point through same route. If her average speed for the entire journey is 45 km/h, then what is her average speed (in km/h) for the return journey?

A. 37.5



B. 40

C. 42.5

D. 42

Q6 Mathematics

Four bells ring at intervals of 4 minutes, 8 minutes, 12 minutes, and 24 minutes respectively. All the four bells rang together at 12 noon. How many times after 12 noon will all the four bells ring together in the next four hours, with the ringing at 4 p.m. being included?

A. 8 times

B. 9 times

C. 10 times



D. 11 times

Q7 Mathematics

If α and β , where $\alpha > \beta$, are the roots of the equation $5x^2 - 3x - 2 = 0$, then what is the value of $(\alpha - 2\beta)$?

A. $\frac{7}{5}$

B. $\frac{1}{5}$

C. $\frac{9}{5}$



D. $\frac{11}{5}$



Q8 Mathematics

If $x^2 + y^2 - 4x + 8y + 20 = 0$, then the value of $x^2 + y^2$ is :

A. 40

B. 30

C. 20



D. 10

Q9 Mathematics

A man has to cover a distance of 150 km in 12 hours. If he covers two-third of this distance in $\frac{5}{8}$ of the time, then what should be his speed (in km/h, correct to one decimal place) to cover the remaining distance in the time left?

A. 6.7

B. 10.5

C. 11.1



D. 11.5

Q10 Mathematics

How many cubic cm of water can a hemispherical container of radius 7 cm hold (rounded off to 2 decimal places) (use $\pi = \frac{22}{7}$)?

A. 616.25

B. 154.75

C. 718.67



D. 1437.33

Q11 Mathematics

The value of $\sqrt{75 + \sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}}}$ is:

A. 9



B. 6

C. 5

D. 3



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Q12 Mathematics

The simple interest on a certain sum for $4\frac{2}{5}$ years at the rate of 9.5% p.a. is ₹3,553. What will be the amount payable on the same sum at 8.4% p.a. simple interest in $7\frac{1}{2}$ years?

- A. ₹14,855
- B. ₹13,850
- C. ₹13,855
- D. ₹13,950

**Q13** Mathematics

For a data, if the mean is 28.5 and the median is 32, then the mode using empirical formula is:

- A. 42
- B. 41
- C. 40
- D. 39

**Q14** Mathematics

The value of $84 - 4 \div 2 \times 3 + 7$ is:

- A. 85
- B. 127
- C. 173
- D. 97

**Q15** Mathematics

ABCD is a quadrilateral in which $AB \parallel DC$, and E and F are the mid points of the diagonals AC and BD, respectively. If $AB = 28$ cm, $BC = 15$ cm, $DC = 40$ cm, and $AD = 9$ cm, then what is the length (in cm) of EF?

- A. 6
- B. 8
- C. 9
- D. 12



Q16 Mathematics

The value of $\frac{20 + 20 \tan^2 A}{50 + 50 \cot^2 A}$ is:

A. $\frac{5}{2} \cot^2 A$

B. $\frac{2}{5} \cot^2 A$

C. $\frac{5}{2} \tan^2 A$

D. $\frac{2}{5} \tan^2 A$ ✓

Q17 Mathematics

A and B started moving at the same time towards each other from points X and Y, respectively. After meeting on the way, A and B took 5.4 hours and p hours, respectively to reach Y and X, respectively. If the speed of B is 50% more than that of A, then what is the value of p ?

A. 1.8

B. 2.7

C. 2.4 ✓

D. 3.6

Q18 Mathematics

If $1.6 : 0.6 :: 0.6 : x$, find the value of x .

A. 0.225 ✓

B. 0.25

C. 0.275

D. 0.98

Q19 Mathematics

For a regular polygon, the sum of the interior angles is 200% more than the sum of its exterior angles. Each interior angle of the polygon measures x° . What is the value of x° ?

A. 144°

B. 135° ✓

C. 140°

D. 108°



Q20 Mathematics

C is twice as efficient as A, while B takes thrice as many days as C to do the same work. A takes 10 days to do the work alone. If they work in pairs [like (A, B), (B, C) and (C, A)], with (A, B) working on the first day, then (B, C) working on the second day and (C, A) working on the third day and continuing the cycle till the work gets completed, then how many days will be required to complete this work?

A. $7\frac{5}{8}$ days

B. $6\frac{1}{8}$ days

C. $5\frac{7}{8}$ days

D. $4\frac{3}{8}$ days

**Q21** Mathematics

If the number 6484y6 is divisible by 8, then find the least value of y?

A. 3

B. 1

C. 7

D. 4

**Q22** Mathematics

If $a : b = 7 : 9$ and $b : c = 15 : 7$, then $a : b : c$ is:

A. 35 : 45 : 21

B. 45 : 35 : 21

C. 21 : 35 : 45

D. 35 : 45 : 25

**Q23** Mathematics

Three times the present age of Renu is 11 years more than two times the present age of Manav, and three times the present age of Manav is 9 years less than four times the present age of Renu. The sum of the present ages (in years) of Renu and Manav is:

A. 29

B. 31

C. 32

D. 37



Q24 Mathematics

Sanjay is 25 years older than his son and Sanjay's wife is 65 years old. If the average age of all the three members of this family is 58 years, then find the age of the son.

A. 42 years



B. 41 years

C. 45 years

D. 43 years

Q25 Mathematics

The surface area of a cuboid having length 6 cm, breadth 7 cm and height 8 cm is:

A. 592 cm^2

B. 492 cm^2

C. 392 cm^2

D. 292 cm^2



Mathematics

25 Questions • Answer Key

Q1 Mathematics

If $\frac{(15x-9)}{x} + \frac{(15y-9)}{y} + \frac{(15z-9)}{z} = 0$, then the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is:

A. 7

B. 6

C. 5

D. 4



Q2 Mathematics

The value of $\sqrt{74529}$ is:

A. 243

B. 259

C. 239

D. 273



Q3 Mathematics

The HCF of the numbers 64, 86, 108 and 260 is:

A. 2

B. 4

C. 6

D. 8



Q4 Mathematics

Five times a number is 65. Find the number.

A. 10

B. 11

C. 13

D. 15



Q5 Mathematics

A boat takes 21 minutes to go 12.6 km upstream. The ratio of the speed of the boat in still water to that of the stream is 7 : 2. How much total time (in hours) will the boat take to go 43.2 km upstream and 38.88 km downstream?

A. 1.6

B. 1.8

C. 2

D. 2.4

Q6 Mathematics

Let $0^\circ < \theta < 90^\circ$. $\sqrt{\frac{\sec^2 \theta + \operatorname{cosec}^2 \theta}{\tan^2 \theta - \sin^2 \theta}} \times \frac{(1 + \tan^2 \theta) \sin^2 \theta}{(\operatorname{cosec} \theta - \cot \theta)(1 + \cos \theta)}$ is equal to:

A. $\operatorname{cosec}^2 \theta \sec^2 \theta$ B. $\sin^2 \theta \cos^2 \theta$ C. $\cot^2 \theta$ D. $\sec^2 \theta$ **Q7 Mathematics**

A solid metallic cuboid of sides 4 cm × 10 cm × 15 cm is melted and made into small identical dices of 2 cm × 2 cm × 2cm. How many such dices can be made?

A. 43

B. 75

C. 36

D. 40

Q8 Mathematics

How many prime numbers are there between 20 and 80?

A. 13

B. 14

C. 15

D. 16



Q9 Mathematics

In a quadrilateral ABCD, $\angle A = 86^\circ$ and $\angle B = 72^\circ$. The bisectors of $\angle C$ and $\angle D$ meet at O. What is the measure of $\angle DOC$?

A. 69°

B. 79° ✓

C. 91°

D. 101°

Q10 Mathematics

The volume of a cube whose side is 12 cm is:

A. 1928 cm^3

B. 1828 cm^3

C. 1728 cm^3 ✓

D. 1628 cm^3

Q11 Mathematics

AB is parallel to CD. A transversal PQ intersects AB and CD at E and F, respectively, and $\angle PEB = 78^\circ$. G is a point between AB and CD such that $\angle BEG = 18^\circ$ and $\angle GFE = 30^\circ$. What is the measure of $\angle EGF$?

A. 58°

B. 66° ✓

C. 68°

D. 72°

Q12 Mathematics

If $a = 5$, then $\sqrt{(4a^2 - 4a + 1)} + 6a$ is:

A. 69

B. 59

C. 49

D. 39 ✓



Q13 Mathematics

A large tanker can be filled by pipes A and B in 60 minutes and 30 minutes, respectively. How much time will it take to fill the empty tanker, if for half the time pipe B is opened and for the remaining time pipes A and B are opened?

- A. 15 minutes
- B. 20 minutes
- C. 24 minutes
- D. 28 minutes

**Q14** Mathematics

A quadratic equation whose roots are $-\frac{2}{3}$ and $-\frac{3}{2}$ is:

- A. $6x^2 + 13x + 1 = 0$
- B. $6x^2 + 13x + 6 = 0$
- C. $6x^2 - 13x + 6 = 0$
- D. $6x^2 - 13x - 1 = 0$

**Q15** Mathematics

Pipe P can fill $\frac{3}{4}$ part of a tank in 18 hours and pipe Q can fill $\frac{3}{5}$ part of the same tank in 12 hours. Both P and Q were kept open for 4 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in $5\frac{1}{2}$ hours. Pipes P, Q and R together can fill the empty tank in:

- A. 30 hours
- B. 35 hours
- C. 36 hours
- D. 40 hours

**Q16** Mathematics

For the equation $2x^2 + bx + 3 = 0$, the smaller root is 0.5. Find the value of b.

- A. 5
- B. -7
- C. -2
- D. 1



Q17 Mathematics

If the mean of the following data is 22, then what is the value of x ?

Class	0-10	10-20	20-30	30-40	40-50
Frequency	12	16	6	7	x

A. 6

B. 9



C. 13

D. 19

Q18 Mathematics

By selling an article for ₹19.50, a man makes a profit of 30%. By how much should the sales price be increased to make a profit of 40%?

A. ₹2.00

B. ₹1.90

C. ₹1.50



D. ₹4

Q19 Mathematics

If ₹12,500 amounts to ₹15,680 in 2 years at $x\%$ compound interest per annum, compounded annually, then the value of x is:

A. 11

B. 12



C. 15

D. 20

Q20 Mathematics

The mean of the first 7 odd prime numbers is:

A. 8.61

B. 7.91

C. 5.41

D. 10.71



Q21 Mathematics

A shopkeeper professes to sell his goods at a 10% loss but uses a false balance and gains 15%. The actual weight (correct to one decimal place) he uses for 1 kg is:

A. 782.6 gm



B. 784.4 gm

C. 785.6 gm

D. 788.4 gm

Q22 Mathematics

The sum of the present ages of a father and his son is 6 years more than 3 times the present age of the son. After 2 years, 2 times the father's age will be 7 years less than 5 times the son's age. The difference (in years) between the ages of the father and the son is:

A. 17

B. 19



C. 20

D. 23

Q23 Mathematics

If $3.2 : x :: x : 16.2$, and $x > 0$, then find the value of x .

A. 5.4

B. 6.3

C. 7.2



D. 9.7

Q24 Mathematics

Suman's present age is twice that of Venkat's. Venkat's age, after 12 years, will be 21 years. Find Suman's present age.

A. 18 years



B. 20 years

C. 22 years

D. 16 years



Q25 Mathematics

The annual income of Ram is ₹5,62,400. He spent 20% of this income on house rent, 15% of the remaining income on food, and 30% of the income still remaining with him on children's education. If the amount still remaining was his savings, which of the following amounts is closest to his actual savings?

A. ₹2,67,730

B. ₹2,76,703

C. ₹2,67,037

D. ₹2,67,703



Mathematics

25 Questions · Answer Key

Q1 Mathematics

Anu is four times as good as Binni in doing a work. Together they finish the same work in 12 hrs. In how many hrs will Anu alone finish the work?

- A. 10 hrs
- B. 11 hrs
- C. 13 hrs
- D. 15 hrs



Q2 Mathematics

What is the median of the following data?

41, 32, 50, 28, 35, 19, 27, 31, 45, 16, 34, 37

- A. 32.5
- B. 33
- C. 33.5
- D. 34



Q3 Mathematics

The cost of 3 pens and 2 pencils is ₹53 and the cost of 2 pens and 5 pencils ₹50. The cost of 5 pens and 3 pencils is:

- A. ₹72
- B. ₹81
- C. ₹87
- D. ₹95



Q4 Mathematics

The shorter side of a rectangle is 10 cm less than the longer side. The numerical value of its area is equal to 6 times the numerical value of its perimeter. What is the length (in cm) of its longer side?

- A. 20
- B. 25
- C. 30
- D. 35



Q5 Mathematics

A shopkeeper sells an item for ₹571.20 after giving two successive discounts of 20% and 15% on its marked price. Had he not given any discount, he would have earned a profit of 12%. What is the cost price (in ₹) of the item?

A. 700

B. 720

C. 750



D. 780

Q6 Mathematics

The volume of a cuboid whose length, breadth and height are 3 cm, 4 cm and 5 cm, respectively, is:

A. 90 cm^3 B. 80 cm^3 C. 70 cm^3 D. 60 cm^3 **Q7 Mathematics**

Three pipes A, B and C can fill a tank in 5 hours, 8 hours and 12 hours, respectively. If all the pipes are opened at the same time, then the time taken to fill the tank is:

A. $5\frac{22}{49}$ hoursB. $4\frac{22}{49}$ hoursC. $3\frac{22}{49}$ hoursD. $2\frac{22}{49}$ hours**Q8 Mathematics**

If ABCD is a rhombus such that $\angle ACB = 40^\circ$, then $\angle ADB$ is:

A. 40° B. 45° C. 50° D. 60° 

Q9 Mathematics

A train crosses a platform of length 200 metres in 40 seconds and a man in 20 seconds. The length of the train is:

- A. 500 metres
- B. 400 metres
- C. 300 metres
- D. 200 metres



Q10 Mathematics

If $4^x - 4^{x-1} = 24$, then the value of $\frac{2x-1}{2x+3}$ is:

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. $\frac{1}{5}$
- D. $\frac{3}{7}$



Q11 Mathematics

Vamsi's father is 60 years old. He is 20 years older than twice Vamsi's age. Find Vamsi's age.

- A. 20 years
- B. 25 years
- C. 15 years
- D. 30 years



Q12 Mathematics

The corresponding sides of two similar triangles are in the ratio of 2: 3. If the area of the smaller triangle is 48 cm^2 , then the area of the bigger triangle is:

- A. 230 cm^2
- B. 106 cm^2
- C. 107 cm^2
- D. 108 cm^2



Q13 Mathematics

The current population of a town is 15,625. It increases by 8% and 12% in two successive years but decreases by 22% in the third year. What is the population of the town at the end of the third year?

A. 13,230

B. 14,742



C. 15,120

D. 14,042

Q14 Mathematics

Find the surface area of a sphere whose diameter is equal to 14 cm.

A. 616 cm^2



B. 524 cm^2

C. 1232 cm^2

D. 1048 cm^2

Q15 Mathematics

If the simple interest on a certain sum for 8 years is $\frac{11}{25}$ of the sum, then the rate of interest per annum is:

A. $8\frac{1}{2}\%$

B. $7\frac{1}{2}\%$

C. $6\frac{1}{2}\%$

D. $5\frac{1}{2}\%$



Q16 Mathematics

If 3 and -7 are the roots of a quadratic equation, then the quadratic equation is:

A. $-x^2 + 4x + 21 = 0$

B. $x^2 + 4x - 21 = 0$



C. $x^2 - 4x - 21 = 0$

D. $x^2 - 4x + 21 = 0$



Q17 Mathematics

When a number is divided by 15, the remainder is 9. What will be the remainder when the same number is divided by 5?

A. 1

B. 4



C. 2

D. 3

Q18 Mathematics

If the numerator of a fraction be increased by 10% and its denominator be reduced by 5%, then the fraction becomes $\frac{4}{5}$. Find the original fraction.

A. $\frac{19}{25}$ B. $\frac{17}{25}$ C. $\frac{23}{55}$ D. $\frac{38}{55}$ **Q19** Mathematics

The value of $\left(\frac{64}{25}\right)^{-\frac{3}{2}} \times \left(\frac{2}{5}\right)^4 \div \sqrt[5]{(32)^{-3}}$ is:

A. $\frac{1}{5}$ B. $\frac{2}{5}$ C. $\frac{8}{25}$ D. $\frac{1}{20}$ 

Q20 Mathematics

$\frac{(1 + \cot\theta - \operatorname{cosec}\theta)(1 + \tan\theta + \sec\theta)(\sec^2\theta)}{(\sec\theta - \cos\theta)(\cot\theta + \tan\theta)}$, $0^\circ < \theta < 90^\circ$, is equal to:

- A. $\cos \theta$
- B. $\sin \theta$
- C. $2 \sec \theta$
- D. $2 \operatorname{cosec} \theta$ ✓

Q21 Mathematics

The list price of a washing machine is ₹13,200. It is sold to a retailer after two successive discounts of 25% and 15%. The retailer wants to earn a profit of 20% on his cost after allowing a 25% discount (on its new list price) to the customer. At what price should he list the washing machine?

- A. ₹13,644
- B. ₹13,464 ✓
- C. ₹13,466
- D. ₹13,664

Q22 Mathematics

If the mode of a data exceeds its mean by 16.2, then the mode exceeds the median by _____. (Use empirical formula to find the answer.)

- A. 8.25
- B. 10.2
- C. 10.8 ✓
- D. 12.4

Q23 Mathematics

The value of $\left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a} \times \left(\frac{x^a}{x^b}\right)^{a+b}$ is equal to:

- A. 3
- B. 2
- C. 1 ✓
- D. 0



Q24 Mathematics

If the product of two numbers is 8410 and their HCF is 29, then their LCM is:

A. 310

B. 290



C. 270

D. 330

Q25 Mathematics

3 bags and 4 pens together cost ₹1,285, whereas 5 bags and 3 pens together cost ₹1,995. The cost of 2 bags exceeds the cost of 11 pens by:

A. ₹390

B. ₹350

C. ₹310



D. ₹300



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The value of $22 \times (63 \div 7) \div 6 - \{7 \times 5 + 4 - (3 - 5) \div 2\}$ is:

A. -7



B. -9

C. 7

D. 11

Q2 Mathematics

The length, the breadth and the height of a closed cuboidal box are 2.5 m, 2 m and 90 cm, respectively. What would be the cost of a canvas needed to cover this box completely, if the cost of the canvas is ₹80 per m^2 ?

A. ₹1,448



B. ₹1,502

C. ₹1,600

D. ₹1,750

Q3 Mathematics

A, B and C together can complete a certain work in 40 days. B and C together can complete the same work in 60 days. B is 25% more efficient than A. A, B and C work together for 30 days. B alone will complete the remaining work in:

A. 20 days

B. 24 days



C. 30 days

D. 32 days



Q4 Mathematics

A and B can do a work alone in 30 days and 40 days, respectively. In how many days will the work be completed if they work on alternate days, starting with B on the first day?

A. $17\frac{1}{3}$ days

B. $17\frac{1}{7}$ days

C. $34\frac{1}{3}$ days



D. $34\frac{2}{3}$ days

Q5 Mathematics

The smallest four-digit number that is exactly divisible by each of 24, 40 and 56 is:

A. 1080

B. 1170

C. 1260

D. 1680

**Q6 Mathematics**

If $(-7)^{2k+1}(-7)^5 = (-7)^{12}$, then k is:

A. -2

B. -3

C. 2

D. 3

**Q7 Mathematics**

The speed of a stream is 4 km/h. A boat can go 40 km downstream and 12 km upstream in 4 hours. What is the speed (in km/h) of the boat in still water?

A. 10

B. 12



C. 14

D. 16



Q8 Mathematics

The value of $\frac{1\frac{2}{3} + 2\frac{1}{2} \times \frac{2}{3}}{5 - 4\frac{1}{2} \div \frac{3}{2}}$ is:

A. $1\frac{2}{3}$



B. $2\frac{1}{3}$

C. $3\frac{1}{3}$

D. $4\frac{2}{3}$

Q9 Mathematics

Four friends Ahmed, Suman, Raj and Madhu, started their own garment shops.

Ahmed provides successive discounts of 6% and 5%.

Suman offers successive discounts of 2% and 5%

Raj offers successive discounts 7% and 2% and Madhu offers successive discounts 5% and 4%.

Who is giving highest total discount to the customers?

A. Ahmed



B. Raj

C. Suman

D. Madhu

Q10 Mathematics

The LCM of the numbers 5, 12.5 and 0.05 is:

A. 1.25

B. 25



C. 12.5

D. 125



Q11 Mathematics

$\frac{\sin\theta(1+\cos\theta)}{1+\cos\theta-\sin^2\theta} \times (\sec\theta + \tan\theta)(1 - \sin\theta), 0^\circ < \theta < 90^\circ$, is equal to :

A. $\cos \theta$

B. $\sin \theta$

C. $\sec \theta$

D. $\operatorname{cosec} \theta$

Q12 Mathematics

12 years ago, the age of father was 28 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

A. 14

B. 15

C. 16

D. 18

Q13 Mathematics

The lengths of the diagonals of a rhombus are 16 cm and 12 cm. The length of the side of the rhombus is:

A. 20 cm

B. 8 cm

C. 10 cm

D. 9 cm

Q14 Mathematics

A man loses 12% by selling an article for ₹330. If he sells it for ₹367.50, what will be his gain/loss percentage?

A. Gain, 2%

B. Loss, 2%

C. Gain, 4%

D. Loss, 4%



Q15 Mathematics

The price (per litre) of petrol increases by 52%. By what percent should its consumption be reduced such that the expenditure on it increases by 14% only?

A. 38%

B. 35%

C. 30%

D. 25%



Q16 Mathematics

If the median of a data is 24.12 less than its mode, then the median of the data exceeds its mean by _____. (Use the empirical formula to find the answer)

A. 16.08

B. 12.06

C. 6.03

D. 8.04



Q17 Mathematics

The total surface area of a cube having side 5 cm is:

A. 325 cm^2

B. 225 cm^2

C. 250 cm^2

D. 150 cm^2



Q18 Mathematics

In a triangle ABC if $\angle ABC = 90^\circ$ and $BA = BC$, then the angles of A and C respectively are:

A. $80^\circ, 70^\circ$

B. $80^\circ, 60^\circ$

C. $50^\circ, 40^\circ$

D. $45^\circ, 45^\circ$



Q19 Mathematics

The amount on a sum of ₹2,400 at 5% per annum compound interest, compounded annually, in 2 years will be:

A. ₹5,646

B. ₹4,646

C. ₹3,646

D. ₹2,646

**Q20** Mathematics

The cost of 4 pens and 3 notebooks is ₹150. The cost of 5 notebooks exceeds the cost of 6 pens by ₹41. What is the cost of 3 pens and 2 notebooks?

A. ₹110.50

B. ₹109.00

C. ₹104.00

D. ₹105.50

**Q21** Mathematics

A dealer buys two articles X and Y for ₹600 each. He marks each of them at the same price. He sells X by giving two successive discounts of 25% and 15% and still earns ₹216 as profit. If he sells Y at a single discount of 46%, then what is the profit percentage on Y?

A. 14%

B. 14.5%

C. 15%

D. 15.2%

**Q22** Mathematics

The heights of six students in a school are 160 cm, 175 cm, 142 cm, 136 cm, 148 cm, and 182 cm. Find the mean of their heights (in cm) (Rounded off to 2 decimal places).

A. 147.57

B. 152.55

C. 157.17

D. 160.47



Q23 Mathematics

The difference in the measures of two complementary angles is 24° . Find the measure of the greater angle.

A. 33° B. 43° C. 55° D. 57° ✓**Q24** Mathematics

A bag contains ₹2, ₹5 and ₹10 coins in the ratio $5 : 7 : 8$, amounting to a total of ₹1250. The number of ₹5 coins in the bag are:

A. 70 ✓

B. 84

C. 78

D. 91

Q25 Mathematics

If a and b are the roots of the equation $x^2 + 3x - 4 = 0$, then the value of $\frac{1}{a} + \frac{1}{b} + ab$ is:

A. $\frac{12}{5}$ B. $-\frac{12}{5}$ C. $\frac{13}{4}$ D. $-\frac{13}{4}$ ✓

Mathematics

25 Questions · Answer Key

Q1 Mathematics

A train crosses a telegraph post and a bridge of length 300 metres in 10 seconds and 20 seconds, respectively. Find the speed of the train.

- A. 69.5 km/h
- B. 75 km/h
- C. 89 km/h
- D. 108 km/h



Q2 Mathematics

The marked price of a cooker is same at four shops I, II, III and IV. Shop I allows two successive discounts of 20% and 15%, shop II allows successive discounts of 18% and 17%, shop III allows successive discounts of 25% and 10% and shop IV allows successive discounts of 15%, 15%, and 5% on the marked price of the cooker. Which shop is selling the cooker at the lowest price?

- A. I
- B. II
- C. III
- D. IV



Q3 Mathematics

Simplify the given expression.

$$\frac{3-5x^2}{1-x^3} + \frac{1}{1-x} - \frac{5x+4}{1+x+x^2}$$

- A. $\frac{x}{1-x^3}$
- B. $\frac{2x}{1-x^3}$
- C. $\frac{x^2}{1-x^3}$
- D. $\frac{2x^2}{1-x^3}$



Q4 Mathematics

A certain sum amounts to ₹98,494 at the rate of 15% per annum in 2 years, interest compounded 8-monthly. What will be the amount payable (in ₹) on the same sum at the same rate and in the same time, if the interest is compounded yearly?

A. 96,785

B. 96,578

C. 97,685

D. 97,865



Q5 Mathematics

A quadrilateral whose sides are equal and all angles between the sides are 90° is called a:

A. trapezium

B. rectangle

C. rhombus

D. square



Q6 Mathematics

A trader gains 25% by selling an article after two successive discounts of 25% and 10% on its marked price. If the cost price of the article is increased by 30%, then what single discount should he now give on the same marked price to get the same profit percentage as earlier?

A. 12.25%

B. 12.5%

C. 10.5%

D. 10%



Q7 Mathematics

A cistern has three pipes A, B and C. A and B alone can completely fill the cistern in 4 hours and 3 hours, respectively, and C can empty the completely filled cistern in 2 hours. If all the three pipes are opened simultaneously in the empty cistern, then the cistern will get completely full in:

A. 10 hours

B. 12 hours

C. 14 hours

D. 16 hours



Q8 Mathematics

Find the volume of a cube whose edge is 8 cm.

A. 521 cm^3

B. 264 cm^3

C. 512 cm^3 ✓

D. 256 cm^3

Q9 Mathematics

What is the median of the following distribution?

Class	100-150	150-200	200-250	250-300	300-350
Frequency	22	18	25	15	20

A. 210

B. 220 ✓

C. 225

D. 240

Q10 Mathematics

The value of $\left(\frac{x^a}{x^b}\right)^c \times \left(\frac{x^b}{x^c}\right)^a \times \left(\frac{x^c}{x^a}\right)^b$ is:

A. 0

B. 1 ✓

C. 2

D. 3

Q11 Mathematics

P spends 36% of his income on food items and 25% of the remaining amount on clothes, medical and conveyance. He saves half of the remaining amount every month. If he saves ₹1,80,000 every year, then find his monthly income.

A. ₹7,50,000

B. ₹6,50,040

C. ₹54,170

D. ₹62,500 ✓



Q12 Mathematics

ABCD is a trapezium in which $BC \parallel AD$ and $AC = CD$. If $\angle ABC = 98^\circ$ and $\angle BAC = 32^\circ$, then what is the measure of $\angle ACD$?

A. 65°

B. 70°

C. 75°

D. 80°

**Q13 Mathematics**

Rajani's father is three times older than Rajani and Rajani is twice as old as her sister Lavanya. Two years from now the sum of the given three person ages will be 60 years. Find the present age of Rajani.

A. 12 years



B. 8 years

C. 36 years

D. 13 years

Q14 Mathematics

In the given data, X is the size of a shirt and F denotes the sale per day. Which sized shirt is in most demand?

X	24	26	28	30	34	36	38	40	42
F	45	67	120	46	76	53	41	22	33

A. 42

B. 34

C. 40

D. 28

**Q15 Mathematics**

What is the smallest natural number that should be added to 1225 such that a remainder of 3 is left when the resulting number is divided by each of the numbers 12, 18, 21 and 28?

A. 35

B. 38



C. 41

D. 43



Q16 Mathematics

$$\frac{(\operatorname{cosec} \theta - \sin \theta)(\sec \theta - \cos \theta)(\tan \theta + \cot \theta)}{\cos \theta (\sec \theta - \tan \theta)^2 (\sec \theta + \tan \theta)} = \frac{1}{1-k}, 0^\circ < \theta < 90^\circ, \text{ then } k = ?$$

A. $\sin \theta$



B. $\cos \theta$

C. $\sec \theta$

D. $\cot \theta$

Q17 Mathematics

The volume of a cylinder having diameter 14 cm and height 5 cm is:

(Use $\pi = \frac{22}{7}$)

A. 990 cm^3

B. 880 cm^3

C. 770 cm^3



D. 660 cm^3

Q18 Mathematics

Which of the following is the least composite number?

A. 4



B. 3

C. 2

D. 1



Q19 Mathematics

Express $0.9\overline{87} - 0.7\overline{56}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{88}{165}$

B. $\frac{219}{495}$

C. $\frac{164}{495}$

D. $\frac{229}{990}$ ✓

Q20 Mathematics

The roots of the quadratic equation $x^2 - 4x + 3 = 0$ are:

A. 1 and 3 ✓

B. 1 and -3

C. -1 and 3

D. -1 and -3

Q21 Mathematics

The common root of the quadratic equations $2x^2 - 5x - 3 = 0$ and $x^2 + x - 12 = 0$ is:

A. 2

B. $-\frac{1}{2}$

C. -4

D. 3 ✓



Q22 Mathematics

Two pipes A and B can fill a tank in 21 hours and 18 hours, respectively. If both the pipes are opened simultaneously, then the time taken to fill the tank is:

A. $11\frac{27}{39}$ hours

B. $10\frac{27}{39}$ hours

C. $9\frac{27}{39}$ hours



D. $8\frac{27}{39}$ hours

Q23 Mathematics

Sujata buys 9 apples and 8 mangoes for ₹276. When the cost of an apple is decreased by 10% and that of a mango remains the same, then the cost of 5 apples and 10 mangoes is ₹210. What is the original cost of 4 apples and 3 mangoes?

A. ₹108

B. ₹116



C. ₹120

D. ₹123

Q24 Mathematics

Simplify the given expression.

$$\left(\frac{8}{125}\right)^{\frac{2}{3}} \times \left(\frac{27}{64}\right)^{-\frac{2}{3}} \div \left(\frac{5}{4}\right)^{-2}$$

A. $\frac{2}{3}$

B. $\frac{3}{5}$

C. $\frac{4}{9}$



D. $\frac{3}{8}$



Q25 Mathematics

The income of Raman is ₹45,000. He saves 12.5% of his income. If his income increases by 18% and expenditure increases by 20%, then his savings will:

A. increase by ₹225



B. decrease by ₹220

C. increase by ₹250

D. decrease by ₹215



Mathematics

25 Questions • Answer Key

Q1 Mathematics

At what rate per annum of simple interest will a sum of ₹7,500 become ₹9,250 in 7 years?

A. $6\frac{1}{3}\%$

B. $5\frac{1}{3}\%$

C. $4\frac{1}{3}\%$

D. $3\frac{1}{3}\%$ ✓

Q2 Mathematics

If α and β , where $\beta > \alpha$, are the roots of the equation $8x^2 + 22x - 21 = 0$, then what is the value of $(2\alpha + 3\beta)$?

A. $-\frac{21}{2}$

B. $\frac{21}{4}$

C. $-\frac{19}{4}$ ✓

D. $\frac{37}{2}$

Q3 Mathematics

The value of $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$ is:

A. $5 + \sec A + \operatorname{cosec} A$

B. $5 - \operatorname{cosec}^2 A + \sec^2 A$

C. $5 + \operatorname{cosec}^2 A - \sec^2 A$

D. $5 + \operatorname{cosec}^2 A + \sec^2 A$ ✓



Q4 Mathematics

The angles opposite to equal sides of a triangle are:

- A. equal
- B. unequal
- C. supplementary
- D. complementary

Q5 Mathematics

Nandan had some marbles. When he distributed the marbles equally among 15 children, he found that 2 marbles were left. Had he distributed the marbles equally among 24 children and 32 children, he still would have had 11 and 19 marbles, respectively, left with him. But when he distributed them equally among 31 children, no marble was left. The number of marbles that Nandan initially had may lie between:

- A. 2350 and 2360
- B. 2360 and 2370
- C. 2370 and 2380
- D. 2380 and 2390

Q6 Mathematics

A solid metallic sphere of radius 12 cm is melted and recast into 27 identical spheres. What is the ratio of the surface area of the original sphere to the total surface area of 6 smaller spheres so formed?

- A. 3 : 1
- B. 3 : 2
- C. 9 : 4
- D. 9 : 8

Q7 Mathematics

A straight angle is equal to

- A. 100°
- B. 90°
- C. 180°
- D. 0°



Q8 Mathematics

Express $4.5\overline{67}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $4\frac{63}{110}$

B. $4\frac{283}{495}$

C. $4\frac{94}{165}$

D. $4\frac{281}{495}$ ✓

Q9 Mathematics

A train crosses a pole in 80 seconds. If the speed of the train is 36 km/h, then the length of the train is:

A. 1200 metres

B. 1000 metres

C. 800 metres ✓

D. 600 metres

Q10 Mathematics

The sum of the ages of 6 children born at intervals of 2 years each is 42 years. What is the age of the eldest child?

A. 12 years ✓

B. 15 years

C. 16 years

D. 19 years

Q11 Mathematics

If $a = 50$, $b = 20$, find the value of $a^3 + b^3$.

A. 1,33,000 ✓

B. 1,75,000

C. 2,03,000

D. 1,56,000



Q12 Mathematics

The sides of a rectangular field are 77 m and 50 m long. Its area is equal to the area of a circular field. What is the perimeter (in m) of the circular field? (Take $\pi = \frac{22}{7}$)

A. 110

B. 165

C. 220



D. 330

Q13 Mathematics

The third proportional to 18 and 72 is:

A. 588

B. 488

C. 388

D. 288

**Q14** Mathematics

Convert 25 grams to kilograms, expressing the answer as a fraction.

A. $\frac{1}{400}$ kgB. $\frac{1}{4}$ kgC. $\frac{1}{40}$ kgD. $\frac{1}{4000}$ kg**Q15** Mathematics

Let x be the greatest number which, when divides 7072, 8505 and 9925, the remainders are 22, 45 and 55, respectively. What is the sum of the digits of x ?

A. 5

B. 6



C. 7

D. 8



Q16 Mathematics

A man covers a certain distance at a speed of 75 km/h in 8 hours. To cover the same distance in 6 hours, his speed needs to be:

- A. 300 km/h
- B. 200 km/h
- C. 150 km/h
- D. 100 km/h

**Q17** Mathematics

Sampark Kranti Express left Delhi for Chennai at 14:30 hours, travelling at a speed of 75 km/h, while Rajdhani Express left Delhi for Chennai on the same day at 16:30 hours, travelling at a speed of 90 km/h, travelling on the same route. How far away from Delhi will the two trains meet?

- A. 950 km
- B. 900 km
- C. 860 km
- D. 820 km

**Q18** Mathematics

The ratio of incomes of Seema and Darshan is 7 : 5. They save ₹12,000 and ₹9,000, respectively. If the ratio of their expenditures is 17 : 12, then what is the total expenditure (in ₹) of Seema and Darshan?

- A. 75,000
- B. 81,000
- C. 87,000
- D. 93,000

**Q19** Mathematics

The mode and median of a data is 23.6 and 24, respectively. What is the mean of the data? (Use empirical formula.)

- A. 23.2
- B. 23.6
- C. 24.2
- D. 24.8



Q20 Mathematics

The roots of the quadratic equation $x^2 - \frac{11x}{2} + 6 = 0$ are

- A. $4/3$ and $3/2$
- B. 4 and $3/2$ ✓
- C. 2 and $3/2$
- D. 2 and $4/3$

Q21 Mathematics

A shopkeeper offers the following schemes on toys of the same marked price.

- (A) Successive discounts of 12% and 15% on any number of toys bought.
- (B) Successive discounts of 15%, 10% and 2% on any number of toys bought.
- (C) 40% discount on the first 3 toys and 15% discount on each toy thereon.
- (D) 2 toys free of cost on buying 10 toys.

A customer wants to buy 10 toys. Which of the above schemes is most beneficial to her?

- A. (A) ✓
- B. (B)
- C. (C)
- D. (D)

Q22 Mathematics

If $P = \frac{x^4 - 8x}{2x^2 + 5x - 3} \times \frac{2x - 1}{x^2 + 2x + 4} \times \frac{x^2 - 9}{x^2 - 2x}$, then $(P^2 - 1)$ is equal to:

- A. $x^2 + 6x + 8$
- B. $x^2 - 6x + 10$
- C. $x^2 + 6x + 10$
- D. $x^2 - 6x + 8$ ✓



Q23 Mathematics

The value of $[89 - (\frac{336}{301}) \times \{68 - (50 \div 3 + \frac{7}{6})\} + 67]$ is:

A. 120

B. 110

C. 100



D. 90

Q24 Mathematics

The average marks of three batches of 25, 31 and 41 students is 20, 26 and 56, respectively. Find the average marks of all the students (rounded off to two places of decimal).

A. 35.45

B. 35.78

C. 36.92

D. 37.13

**Q25** Mathematics

During a sale $66\frac{2}{3}\%$ of the goods are sold at 26% profit, 25% of the remaining goods are sold at 20% profit and the still remaining goods are sold at a loss of 40%. If there is an overall profit of $x\%$, then what is the value of x ?

A. 8

B. 8.5

C. 9



D. 9.5



Mathematics

25 Questions · Answer Key

Q1 Mathematics

The sides of a triangle are 32 cm, 60 cm, and 68 cm. What is its area (in cm^2)?

A. 1088

B. 1020

C. 990

D. 960



Q2 Mathematics

The least number that is exactly divisible by 24, 88 and 136 is:

A. 4488

B. 5445

C. 3894

D. 6433



Q3 Mathematics

D and E are the midpoints of sides AB and AC of a triangle ABC, respectively, and $BC = 6$ cm. If $DE \parallel BC$, then the length of DE is:

A. 2.5 cm

B. 3 cm

C. 5 cm

D. 6 cm



Q4 Mathematics

Find the number whose one third part exceeds the one fifth part by 6.

A. 35

B. 45

C. 50

D. 40



Q5 Mathematics

In two triangles DEF and PQR, if $DE = QR$, $EF = PR$ and $FD = PQ$, then:

- A. $\triangle DEF \cong \triangle PQR$
- B. $\triangle FED \cong \triangle PRQ$ ✓
- C. $\triangle EDF \cong \triangle RPQ$
- D. $\triangle PQR \cong \triangle EFD$

Q6 Mathematics

A sum of ₹ x amounts to ₹50,578 in $2\frac{1}{2}$ years at 12% p.a., interest compounded 10-monthly. What is the value of x ?

- A. 36,000
- B. 38,000 ✓
- C. 40,000
- D. 42,000

Q7 Mathematics

A shopkeeper lists the price of a fan at 22% above its cost price and offers a 15% discount on its list price. If he earns a profit of ₹111, then what is the list price (in ₹) of the fan?

- A. 3,500
- B. 3,660 ✓
- C. 3,680
- D. 4,200

Q8 Mathematics

The value of $45 - 5 \times [2 + 3 \times \{2 - 2(3 - 5) \times 3\} \div 7]$ is:

- A. 1
- B. 5 ✓
- C. 10
- D. 35



Q9 Mathematics

The value of $(1 + \tan 20^\circ + \sec 20^\circ)(1 + \cot 20^\circ - \operatorname{cosec} 20^\circ)$ is:

A. 2



B. 1

C. 0

D. -1

Q10 Mathematics

A father told his son, "At the time of your birth I was as old as you are at present." If the father's present age is 40 years, then how old was the son 5 years ago?

A. 14 years

B. 15 years



C. 16 years

D. 18 years

Q11 Mathematics

The ratio between the third proportional of 20 and 50 and the mean proportional of 9 and 16 is:

A. 25: 2

B. 2: 25

C. 125: 12



D. 12: 125

Q12 Mathematics

A bus covers a distance of 160 km in $3\frac{1}{4}$ hr with one stop of 10 min and one more stop of 5 min on the way. Find the average speed of the bus.

A. $51\frac{1}{3}$ km/h

B. $52\frac{1}{3}$ km/h

C. $53\frac{1}{3}$ km/h



D. $50\frac{1}{3}$ km/h



Q13 Mathematics

For certain data, the mode is 24.6 and mean is 20.1. What is the median of that data?

A. 23.5

B. 22.2

C. 21.6



D. 24.1

Q14 Mathematics

If the mixed recurring decimal $0.23\overline{45}$ is expressed as a fraction in its lowest terms, then the denominator exceeds the numerator by:

A. 421



B. 512

C. 375

D. 627

Q15 Mathematics

A conference is being organised by an educational institute, where the participants will be educators of different subjects. The number of participants in physics, chemistry and mathematics are 112, 144 and 192, respectively. In each room an equal number of participants are to be seated, and all participants in a room should be educators of the same subject. What is the minimum number of rooms required during the event?

A. 23

B. 28



C. 32

D. 35

Q16 Mathematics

Arvind bought an article for ₹ x . He sold it to Biru at a loss of 15%. Biru spent ₹126 on its transportation and sold it to Minu at a profit of 25%. If Minu bought it for ₹1475, then what is the value of ₹ x ?

A. ₹1,160

B. ₹1,240



C. ₹1,280

D. ₹1,320



Q17 Mathematics

A can complete a piece of work in 12 days and B can complete it in 20 days. If they work on alternate days, starting with B on first day, then in how many days will the work be finished?

A. 15

B. $15\frac{1}{5}$ C. $15\frac{2}{3}$ D. $15\frac{4}{5}$ **Q18** Mathematics

The ratio between the radius of the base and the height of a cylinder is 3 : 4. If its volume is 38808 cm^3 then, using $\pi = \frac{22}{7}$, find the radius of the cylinder.

A. 21 cm



B. 14 cm

C. 28 cm

D. 35 cm

Q19 Mathematics

Salaries of A and B were in the ratio 3 : 4. After the salary of each of A and B is increased by ₹3,000, the new ratio becomes 18 : 23. What is A's salary after the increase?

A. ₹18,000



B. ₹12,000

C. ₹23,000

D. ₹21,000

Q20 Mathematics

The area of a rectangle increases by 2 m^2 , if its length is increased by 4 m and breadth is decreased by 2 m. If the length is decreased by 3 m and breadth is increased by 5 m, then its area increases by 23 m^2 . What is the perimeter of the original rectangle (in m)?

A. 42

B. 44



C. 48

D. 52



Q21 Mathematics

A bus travels two-fifth of the distance at a speed of 50 km/h and the remaining distance at a speed of 60 km/h. What is the average speed of the bus for the whole journey?

A. $57\frac{2}{9}$ km/h

B. $56\frac{8}{9}$ km/h

C. $55\frac{5}{9}$ km/h



D. $54\frac{7}{9}$ km/h

Q22 Mathematics

A and B can do a work alone in 30 days and 40 days, respectively. If they worked together and got ₹2,800 for doing the work, then the share of A will be:

A. ₹1,500

B. ₹1,400

C. ₹1,200

D. ₹1,600

**Q23 Mathematics**

If the equation $2x^2 + kx + 3 = 0$, $k > 0$, has real and equal roots, then the value of k satisfies the equation:

A. $k^2 - \sqrt{6} k - 12 = 0$



B. $k^2 + \sqrt{6} k - 12 = 0$

C. $k^2 - \sqrt{3} k - 6 = 0$

D. $k^2 + \sqrt{3} k - 6 = 0$

Q24 Mathematics

If $\left(\frac{512}{125}\right)^3 \times \left(\frac{512}{125}\right)^k = \left(\frac{8}{5}\right)^{15}$, then k is:

A. -2

B. -1

C. 2



D. 3



The roots of the equation $x^2 - 5x + 6 = 0$ are:

A. $-2, 3$

B. $2, -3$

C. $-2, -3$

D. $2, 3$



Mathematics

25 Questions · Answer Key

Q1 Mathematics

How much will a sum of ₹16,000 become after one year if the interest is compounded half-yearly at 20% per annum compound interest?

A. ₹19,200

B. ₹19,360



C. ₹19,480

D. ₹19,720

Q2 Mathematics

What is the mode of the following data?

66, 69, 83, 69, 84, 74, 71, 83, 69, 84, 73, 83, 69, 71, 84, 74, 83, 66, 74, 71, 83, 66, 90, 90

A. 74

B. 83



C. 84

D. 90

Q3 Mathematics

A two-digit number is equal to 7 times the sum of its digits. The number obtained by interchanging the digits is 18 less than the original number. The product of the digits of the number is:

A. 8



B. 12

C. 10

D. 18

Q4 Mathematics

If $\left(\frac{3}{7}\right)^8 \times \left(\frac{3}{7}\right)^{-14} = \left(\frac{3}{7}\right)^{3p-3}$, then the value of p is:

A. -2

B. -1



C. 0

D. 1



Q5 Mathematics

A and B can do a work in 18 days, B and C can do the same work in 15 days, while A and C can do the work in 12 days. The time taken by them to complete the work by working together is:

A. $11\frac{27}{37}$ days

B. $10\frac{27}{37}$ days

C. $9\frac{27}{37}$ days



D. $8\frac{27}{37}$ days

Q6 Mathematics

The fourth proportional to 15, 10 and 12 is:

A. 10

B. 12

C. 8



D. 6

Q7 Mathematics

A pipe can fill a tank in 15 hours. Another pipe can empty the filled tank in 24 hours. If both the pipes are opened simultaneously, then the time in which the tank will be filled is:

A. 70 hours

B. 60 hours

C. 50 hours

D. 40 hours

**Q8 Mathematics**

In quadrilateral ABCD, AB = 17 cm, BC = 8 cm, CD = 9 cm, AD = 12 cm, and AC = 15 cm. What is the area (in cm^2) of the quadrilateral?

A. 110

B. 114



C. 140

D. 144



Q9 Mathematics

3 men and 2 women can complete a piece of work in 8 days, while 2 men and 3 women can complete the same work in 10 days. In how many days can 2 men and 1 women complete the same work?

A. 15

B. 13.5

C. 13

D. 12.5 **Q10 Mathematics**

Express $7.8\overline{964}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $7\frac{166}{185}$ B. $7\frac{4478}{4995}$ C. $7\frac{996}{1111}$ D. $7\frac{8956}{9999}$ **Q11 Mathematics**

If α and β are the roots of $x^2 - 5x + 3 = 0$, then a quadratic equation whose roots are α^2 and β^2 is:

A. $x^2 - 19x + 9 = 0$ B. $x^2 + 19x - 9 = 0$ C. $x^2 + 19x + 9 = 0$ D. $x^2 - 19x - 9 = 0$ **Q12 Mathematics**

Find the value of $\frac{183 \times 183 \times 183 - 73 \times 73 \times 73}{183 \times 183 + 183 \times 73 + 73 \times 73}$.

A. 256

B. 136

C. 210

D. 110 

Q13 Mathematics

A man sold an article for ₹405 by first giving a $d\%$ discount on its marked price, and then another discount having the same nominal value (in ₹). If the marked price of the article is ₹540, then what is the value of d ?

A. 10.5

B. 12

C. 12.5



D. 15

Q14 Mathematics

Let $P = \left(\frac{1}{x} - \frac{1}{y}\right) [(x + y)^2 - xy] + \left(\frac{1}{x} + \frac{1}{y}\right) [(x - y)^2 + xy]$ and $Q = \frac{y}{x}$, then $P \div Q$ is equal to:

A. $2y$ B. $2x$ C. $\frac{x}{y}$ D. $\frac{y}{x}$ **Q15** Mathematics

The number of sides of a regular polygon whose sum of all interior angles is 2700° is:

A. 18

B. 17



C. 16

D. 15

Q16 Mathematics

Last year, Ganga's monthly salary was ₹12,000 and Saraswathi's monthly salary was ₹10,000. This year, Ganga's monthly salary is ₹14,400 while Saraswathi's monthly salary is ₹12,500. If the percentage increase in Saraswathi's monthly salary this year over her monthly salary last year is denoted by $x\%$, and the percentage increase in Ganga's monthly salary this year over her monthly salary last year is denoted by $y\%$, then what is the value of $\left(\frac{x-y}{y} \times 100\right)\%$?

A. 20%

B. 24%

C. 25%



D. 22%



Q17 Mathematics

An article is sold for ₹303.60 after offering three successive discounts of 25%, 8% and $x\%$ on its marked price of ₹500. If the same article is sold after giving a single discount of $(33 + x)\%$, then its selling price (in ₹) will be:

A. 275



B. 280

C. 285

D. 300

Q18 Mathematics

The value of $\frac{(\sin 70^\circ - 2 \sin^3 70^\circ)}{(2 \cos^3 70^\circ - \cos 70^\circ)}$ is:

A. $\cot 70^\circ$

B. $\operatorname{cosec} 70^\circ$

C. $\sec 70^\circ$

D. $\tan 70^\circ$

**Q19** Mathematics

For certain data, the mode is 6 more than the mean and its median is 13. What is the mode of that data?

A. 14

B. 17



C. 15

D. 11

Q20 Mathematics

In finding the HCF of two numbers by division method, the quotients are 1, 5 and 2, respectively, and the last divisor is 15. What is the LCM of the two numbers?

A. 3045

B. 2115

C. 2130

D. 2145



Q21 Mathematics

If 2 and -3 are the roots of a quadratic equation, then the equation is:

A. $x^2 - x + 6 = 0$

B. $x^2 - x - 6 = 0$

C. $x^2 + x + 6 = 0$

D. $x^2 + x - 6 = 0$ ✓

Q22 Mathematics

A person spent ₹273 on buying a total of 50 pens and pencils. If the cost of each pen is ₹6 and that of each pencil is ₹5, then how many pens did he buy?

A. 23 ✓

B. 27

C. 25

D. 21

Q23 Mathematics

The total count of prime numbers less than 50 is:

A. 17

B. 15 ✓

C. 14

D. 13

Q24 Mathematics

Triangle ABC is similar to triangle PQR with $\frac{BC}{QR} = \frac{1}{5}$. $\frac{\text{Area (triangle PQR)}}{\text{Area (triangle ABC)}}$ is:

A. 25 ✓

B. 5

C. $1/25$

D. $1/5$



Q25 Mathematics

If the radius of the base of a right circular cylinder is decreased by 20% and its height is increased by 125%, then what is the percentage increase in its volume?

A. 36%

B. 44%



C. 60%

D. 65%



Mathematics

25 Questions · Answer Key

Q1 Mathematics

If ₹2,400 is to be distributed between A and B in the ratio of 7: 5, then the share of B is:

A. ₹1,900

B. ₹1,600

C. ₹1,300

D. ₹1,000



Q2 Mathematics

A sum of ₹5,800 is invested at 6% per annum simple interest. How much will the sum become after 4 years?

A. ₹9,192

B. ₹8,192

C. ₹7,192

D. ₹6,192



Q3 Mathematics

Express $0.3\overline{59}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{178}{495}$ B. $\frac{179}{495}$ C. $\frac{359}{990}$ D. $\frac{119}{330}$ 

Q4 Mathematics

Two positive numbers differ by 3422. When the greater number is divided by the smaller number, the quotient is 4 and the remainder is 290. What is the HCF of the greater of the two given numbers and 4292?

A. 58



B. 74

C. 116

D. 148

Q5 Mathematics

The sum of the age of A and twice the age of B is 42 years. When two times the age of A is added to three times the age of B, the result is 69 years. The sum of the ages (in years) of A and B is:

A. 27



B. 29

C. 30

D. 31

Q6 Mathematics

The curved surface area of a cylinder having radius 15 cm and height 32 cm is:

A. $1060 \pi \text{ cm}^2$

B. $960 \pi \text{ cm}^2$



C. $860 \pi \text{ cm}^2$

D. $760 \pi \text{ cm}^2$

Q7 Mathematics

If one root of the equation $4x^2 - 2x + k - 4 = 0$ is reciprocal of the other, the value of k is:

A. -8

B. 8



C. -4

D. 4



Q8 Mathematics

$8 : 4 :: 3.2 : x$ and $3 : 6 :: 6 : y$. What is the ratio of x to y ?

A. $2 : 15$



B. $4 : 9$

C. $1 : 3$

D. $3 : 8$

Q9 Mathematics

What is the mode of the following data?

43, 41, 46, 48, 43, 50, 54, 41, 48, 54, 46, 43, 48, 50, 46, 48, 50, 54

A. 46

B. 48



C. 50

D. 54

Q10 Mathematics

A train overtakes two persons who are walking at 15 m/s and 35 m/s, respectively, in the same direction as that of the train in 20 seconds and 40 seconds, respectively. The length of the train is:

A. 1000 m

B. 900 m

C. 800 m



D. 700 m

Q11 Mathematics

Which of the following is a quadratic equation whose roots are 7 and 12?

A. $x^2 - 19x + 84 = 0$



B. $x^2 - 14x + 84 = 0$

C. $x^2 - 19x + 34 = 0$

D. $2x^2 - 19x + 84 = 0$



Q12 Mathematics

The total expenditure of Krishna in a year is ₹4,20,000. If his salary per month is ₹45,000, then find his average savings per month.

A. ₹10,000



B. ₹12,000

C. ₹14,000

D. ₹16,000

Q13 Mathematics

A can do a piece of work in 12 days, B can do the same work in 15 days. C can do the same work in 9 days. The time taken by them to finish the same work if they work together is:

A. $5\frac{39}{47}$ days

B. $4\frac{39}{47}$ days

C. $3\frac{39}{47}$ days



D. $2\frac{39}{47}$ days

Q14 Mathematics

If the angles $(3x - 5)^\circ$ and 80° form a pair of supplementary angles, then the value of x is:

A. 90°

B. 50°

C. 45°

D. 35°

**Q15** Mathematics

The value of

$$5^3 - 9^2 + (12 \div 4)^2 - 32 + 8 \times 0 =$$

A. 21



B. -15

C. 25

D. 61



Q16 Mathematics

The circumference of the base of a solid right circular cylinder is 136.4 cm and its height is 50 cm. What is the volume (in cm^3) of the cylinder? (Take $\pi = \frac{22}{7}$).

A. 10571

B. 31713

C. 63426

D. 73997 **Q17** Mathematics

The list price of an article is ₹1,200 and a discount of 15% is offered on the list price. What additional discount per cent on the already discounted price must be offered to a customer to bring the net selling price to ₹887.40?

A. 11.5%

B. 12%

C. 12.5%

D. 13% **Q18** Mathematics

A person can complete a journey in 14 hours. He covers the first one-third of the distance at the rate of 40 km/h and the remaining distance at the rate of 60 km/h. What is the total distance of his journey?

A. 360 km

B. 480 km

C. 540 km

D. 720 km **Q19** Mathematics

The value of $2 + [2 + 2 \div \{2 + 2 \div (2 + \frac{1}{3})\}]$ is:

A. $\frac{37}{10}$ B. $\frac{67}{10}$ C. $\frac{57}{10}$ D. $\frac{47}{10}$ 

Q20 Mathematics

Gopal went to a bank to withdraw ₹4,000. He asked the cashier to give the cash in ₹50 and ₹100 notes only. Gopal got 50 notes in all. How many ₹50 notes did he receive?

A. 32

B. 30

C. 24

D. 20

**Q21** Mathematics

An article is sold at a profit of 28%. If the cost price is increased by ₹50 and the selling price is reduced by ₹18, then the profit would be 11.6%. What is the original cost price (in ₹) of the article?

A. 350

B. 400

C. 450

D. 480

**Q22** Mathematics

The value of $\left[\frac{\cos 40^\circ}{1 + \sin 40^\circ} \right] + \left[\frac{1 + \sin 40^\circ}{\cos 40^\circ} \right]$ is:

A. $2 \tan 40^\circ$ B. $2 \cot 40^\circ$ C. $2 \operatorname{cosec} 40^\circ$ D. $2 \sec 40^\circ$ **Q23** Mathematics

Three children are making cards for people at an old age home. They take 12 min, 18 min and 20 min respectively to complete a card. If they start making the cards at the same time, after how many minutes, will they again start a new card together?

A. 180 min

B. 140 min

C. 130 min

D. 110 min



Q24 Mathematics

Six years ago, the average age of L and M was 39 years and the average of the present ages of L, M and N is 54 years. What will be the age of N 5 years from now?

A. 97 years

B. 92 years

C. 77 years



D. 72 years

Q25 Mathematics

A hollow spherical shell is made of a metal of density 6 g/cm^3 . Its internal and external radii are 8 cm and 9 cm, respectively. What is the weight (in kg) of the shell (take $\pi = \frac{22}{7}$)?

A. 4.546

B. 5.456



C. 6.642

D. 6.462



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The average of 10 observations is 46. It was realised later that an observation was misread as 42 in place of 142. Find the correct average.

A. 56



B. 65

C. 54

D. 45

Q2 Mathematics

The value of $(\operatorname{cosec} A + \cot A)(1 - \cos A)$ is:

A. $\sin A$ B. $\cos A$ C. $\tan A$ D. $\cot A$

Q3 Mathematics

The areas of three adjacent faces of a solid cuboid are 66 cm^2 , 108 cm^2 and 198 cm^2 . What is the volume (in cm^3) of the cuboid?

A. 594

B. 891

C. 1188



D. 1782

Q4 Mathematics

Two numbers are in the ratio 7: 5. If their sum is 360, then the difference between them is:

A. 90

B. 80

C. 70

D. 60



Q5 Mathematics

Three chairs and two tables cost ₹7,000 and five chairs and three tables cost ₹11,000. What is the cost of four chairs and two tables?

A. ₹6,000

B. ₹8,000



C. ₹9,000

D. ₹9,600

Q6 Mathematics

If $\left(\frac{12}{7}\right)^5 \times \left(\frac{7}{12}\right)^8 \times \left(\frac{12}{7}\right)^{16} = \left(\frac{7}{12}\right)^{2m+10}$, then $m =$

A. $\frac{23}{2}$

B. $-\frac{23}{2}$



C. $\frac{19}{2}$

D. -1

Q7 Mathematics

When x is added to each of 11, 14, 31 and 38, then the numbers so obtained, in this order, are in proportion. Then, if $3x : y :: y : (8x - 5)$, and $y > 0$, what is the value of y ?

A. 12

B. 15

C. 16

D. 18

**Q8 Mathematics**

If α, β ($\alpha > \beta$) are the roots of the quadratic equation $x^2 - 10x + 16 = 0$, then the value of $\alpha^4 - \beta^4$ is:

A. -5080

B. -4080

C. 5080

D. 4080



Q9 Mathematics

By selling an article at $\frac{7}{12}$ of its actual selling price, Manav incurs a loss of 16%. If he sells it at 80% of its actual selling price, then the profit percentage is:

A. 14.5%

B. 14.8%

C. 15.2%



D. 15.5%

Q10 Mathematics

Two parallel lines intersect at:

A. one point

B. two points

C. three points

D. no point



Q11 Mathematics

The volume of a cylinder having height 21 cm and radius 10 cm is:

(Use $\pi = \frac{22}{7}$)

A. 9900 cm³

B. 8800 cm³

C. 7700 cm³

D. 6600 cm³



Q12 Mathematics

The value of $\frac{(9.8 \times 9.8 - 5.8 \times 5.8)}{2 \times (7.8)}$ is:

A. 6

B. 5

C. 4



D. 3



Q13 Mathematics

The ratio of the present ages of P and Q is 5: 8. After 5 years, Q's age will be 45 years. Six years ago, the age of P was:

- A. 34 years
- B. 29 years
- C. 24 years
- D. 19 years

**Q14** Mathematics

A can complete a piece of work in 35 days. B is 30% less efficient than A. C is 25% more efficient than B. B and C work together for 10 days. A alone will complete the remaining work in:

- A. 18 days
- B. $18\frac{1}{2}$ days
- C. $19\frac{1}{4}$ days
- D. 20 days

**Q15** Mathematics

If the mean of the following data is 18, then the value of **X** is:

x_i	10	15	20	25
f_i	5	X	7	8

- A. 9
- B. 10
- C. 11
- D. 13

**Q16** Mathematics

The diagonals of a rhombus shaped field are 96 m and 110 m long. What is the perimeter (in m) of the field?

- A. 288
- B. 292
- C. 296
- D. 300



Q17 Mathematics

When 1833, 2482 and 3190 are divided by the greatest number x , the remainder in each case is y . What is the value of $(3x - 14y)$?

A. 121



B. 123

C. 131

D. 133

Q18 Mathematics

Rajesh has 180 litres of Oil A and 220 litres of Oil B. He fills a number of identical containers with the two types of oil in a manner that each container has only one type of oil, and all containers are completely filled. What can be the maximum volume (in litres) of each container that Rajesh uses, so that all the oil that Rajesh has, of both the types, can be poured into these containers?

A. 20



B. 40

C. 60

D. 80

Q19 Mathematics

Find the nature of the roots of $2x^2 + 4 - 10x = 0$.

A. No real roots

B. Real and equal roots

C. Real and distinct roots



D. Imaginary roots

Q20 Mathematics

A shopkeeper mixes 30 kg wheat costing ₹13.65 per kg with 20 kg wheat costing ₹18.15 per kg. At what rate per kg should he sell the mixed variety of wheat to earn 30% profit (correct to the nearest rupee)?

A. ₹15

B. ₹17

C. ₹18

D. ₹20



Q21 Mathematics

The value of $20 + \frac{24}{7} \times \{(1 \div 2) + (2 \div 3)\}$ is:

A. 28

B. 32

C. 34

D. 24

**Q22** Mathematics

Two mini trains of length 80 m and 120 m, respectively, are moving on parallel tracks in opposite directions at 30 m/s and 20 m/s respectively. The time taken (in seconds) by both the mini trains to cross each other is:

A. 10

B. 8

C. 6

D. 4

**Q23** Mathematics

Train A running at a speed of 63 km/h takes 21 seconds to completely cross train B running at 45 km/h in the opposite direction. The length of train B is 2.5 times the length of train A. Train B crosses a bridge completely in 76 seconds. The length of the bridge (in m) is:

A. 480

B. 500

C. 660

D. 880

**Q24** Mathematics

Three times the present age of P exceeds the present age of Q by 25 years. After 10 years, twice the age of Q will be 18 years less than thrice the age of P. The present age of Q is (in years):

A. 16

B. 17

C. 19

D. 21



Q25 Mathematics

If a discount of 10% is given on the marked price of a book, the bookseller gains 20%. If the discount is increased to 12.5%, then what is the gain percent of the bookseller?

A. $18\frac{2}{3}\%$

B. $17\frac{2}{3}\%$

C. $16\frac{2}{3}\%$



D. $15\frac{2}{3}\%$



Mathematics

25 Questions · Answer Key

Q1 Mathematics

The marked price of an item is ₹250 and a shopkeeper allows a discount of 30%. The selling price of the item is:

A. ₹195

B. ₹185

C. ₹175



D. ₹165

Q2 Mathematics

A started a business with a capital of ₹4,50,000. After 3 months, B joined him with a certain amount of capital. At the end of a year of A's starting the business, the profit was shared in the ratio 3 : 2. How much (in ₹) did B invest?

A. 3,20,000

B. 3,60,000

C. 4,00,000



D. 4,20,000

Q3 Mathematics

The value of $\sqrt{625} + \sqrt{0.25} - \sqrt{0.000025}$ is:

A. 25.395

B. 25.495



C. 25.5

D. 25.405

Q4 Mathematics

The ratio of the present ages of a father and son is 7 : 4. The product of their ages is 6300. The age of the son is:

A. 80 years

B. 70 years

C. 60 years



D. 50 years



Q5 Mathematics

12 unskilled and 14 skilled workers together complete a certain piece of work in 9 days. If each unskilled worker takes twice the time taken by a skilled worker to finish the work, in how many days will 12 skilled workers finish the same work?

A. 10 days

B. 12 days

C. 15 days



D. 18 days

Q6 Mathematics

The marked price of an article is ₹100. If the article is sold at a discount of 25%, then 25% profit is realised. The percentage loss or percentage profit made (approximately) if it is sold for ₹20 less than the marked price is:

A. $33\frac{1}{3}\%$ profit



B. 25% profit

C. $12\frac{1}{2}\%$ loss

D. 35% loss

Q7 Mathematics

The HCF of $(x^4 - y^4)$, $(x^8 - y^8)$ and $(x^2 - y^2)$ is:

A. $(x - y)(x + y)$



B. $(x + y)(x + y)$

C. $(x - y)(x + y)(x + y)$

D. $(x - y)(x + y)(x - y)(x + y)$

Q8 Mathematics

The value of

$$\frac{\sin^2 54^\circ + \sin^2 36^\circ}{\tan^2 40^\circ - \operatorname{cosec}^2 50^\circ} \text{ is:}$$

A. 1

B. 0

C. -1



D. 2



Q9 Mathematics

A solid cube with an edge of 10 cm is cast into cuboids of dimensions $4\text{ cm} \times 2\text{ cm} \times 1\text{ cm}$. The number of such cuboids that can be cast through it is:

A. 125



B. 130

C. 120

D. 100

Q10 Mathematics

The compound interest earned in 1 year on ₹40,000 at the rate of 40% per annum, compounded quarterly, is:

A. ₹28,564

B. ₹18,564



C. ₹18,264

D. ₹28,264

Q11 Mathematics

A man is 4 times as old his son. After 6 years, the man's age will be three times that of his son. The sum of their present ages is:

A. 90 years

B. 80 years

C. 70 years

D. 60 years



Q12 Mathematics

One year ago, a man was 7 times as old as his daughter. Now his age is equal to the square of his daughter's age. If the daughter has already celebrated her first year birthday, then their present ages are:

A. 6 and 36



B. 7 and 49

C. 5 and 25

D. 4 and 28



Q13 Mathematics

The third proportional to $(x^3 - y^3)$ and $(x - y)$ is:

A. $\frac{x - y}{x^2 - xy + y^2}$

B. $\frac{(x - y)^2}{x^2 - xy + y^2}$

C. $\frac{x - y}{x^2 + xy + y^2}$ ✓

D. $\frac{(x - y)^2}{x^2 + xy + y^2}$

Q14 Mathematics

The HCF and LCM of two numbers are 24 and 456, respectively. If one number is 96, then the other number is:

A. 192

B. 114 ✓

C. 112

D. 216

Q15 Mathematics

The total surface area of a cube whose main diagonal length is $16\sqrt{3}$ cm is:

A. 1764 cm^2

B. 1854 cm^2

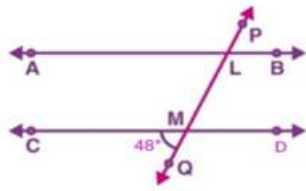
C. 1868 cm^2

D. 1536 cm^2 ✓

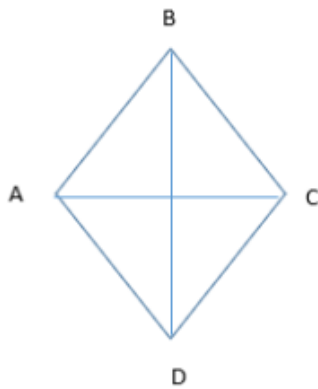


Q16 Mathematics

In the given figure, AB and CD are parallel lines intersected by a transversal PQ at L and M, respectively. If $\angle CMQ = 48^\circ$, then $\angle PLA$ is:

A. 110° B. 120° C. 132° D. 125° **Q17** Mathematics

If ABCD is a rhombus such that $\angle ACB = 50^\circ$, then $\angle BDC$ will be:

A. 40° B. 50° C. 55° D. 60° **Q18** Mathematics

If $x^4 + \frac{1}{x^4} = 27$, then what is the value of $x^2 + \frac{1}{x^2}$?

A. 31

B. 29

C. $\sqrt{31}$ D. $\sqrt{29}$ 

Q19 Mathematics

The value of $5\sqrt{6} - \sqrt{[3(4-2)]} + \left(\frac{12}{\sqrt{6}}\right)$ is:

A. $5\sqrt{6}$

B. $6\sqrt{6}$ ✓

C. $7\sqrt{6}$

D. $8\sqrt{6}$

Q20 Mathematics

The average sale of cars by a dealer per day in the month of March, other than on Saturdays and Sundays, is 125. The average sale of cars per day on Sundays is 150. What is the average sale of cars per day on Saturdays, if the first Saturday is on the 3rd of March and average sale of cars per day for the whole month is 130?

A. 140

B. 138

C. 136 ✓

D. 132

Q21 Mathematics

A man goes from place A to B at a speed of 18 km/h and returns from B to A at a speed of 30 km/h using the same route. The average speed for the whole journey is:

A. $52\frac{1}{2}$ km/h

B. $42\frac{1}{2}$ km/h

C. $32\frac{1}{2}$ km/h

D. $22\frac{1}{2}$ km/h ✓



Q22 Mathematics

The value of $47 + \{7 + [61 - (21 \div 3)] \div 9\}$ is:

A. 100

B. 80

C. 60



D. 40

Q23 Mathematics

Roots of the equation $x^2 - 5x - 14 = 0$ are:

A. 7, -2



B. 2, -7

C. 3, -2

D. 5, -3

Q24 Mathematics

If $x+y = 8$, product of x and y is 15, then the value of $x^4 + y^4$ is:

A. 906

B. 806

C. 706



D. 606

Q25 Mathematics

There are 20 members in group A, 32 members in group B and 28 members in group C. All the members of these groups went to a restaurant. The average amount spent on each member of group A, B and C is ₹120, ₹125 and ₹100, respectively. The total average amount (in ₹) spent per member is:

A. 112

B. 115



C. 116

D. 118



Mathematics

25 Questions · Answer Key

Q1 Mathematics

Pipe A can fill a cistern in 6 hours and B can fill it in 30 hours. Both pipes were turned on but there was a leakage in the bottom of the cistern. So, the cistern took 30 minutes more to fill. The time that the leakage will take to empty the full cistern is:

A. 54 hours

B. 55 hours



C. 65 hours

D. 60 hours

Q2 Mathematics

The median of the observations 4, 14, 11, 8, 7, 8, 9, 12, 4 and 6 is:

A. 11

B. 10

C. 9

D. 8



Q3 Mathematics

A sum of ₹4,800 is divided between A, B and C such that the ratio of the share of A to the combined share of B and C is 3 : 5 and C receives $\frac{5}{7}$ of what A and B together receive. The difference (in ₹) of A's share and B's share is:

A. 800



B. 850

C. 900

D. 1,000

Q4 Mathematics

The average marks obtained in mathematics by the students of a class was 70. The average marks obtained by the boys is 20% more than the average marks obtained by the girls. If the ratio of the number of boys to that of girls is 3 : 2, then the average marks obtained by the girls is:

A. 62.5



B. 63

C. 63.5

D. 65



Q5 Mathematics

If the cost price of an item is ₹4,500 and its selling price is ₹3,500, then the loss percentage is:

A. $55\frac{2}{9}\%$

B. $44\frac{2}{9}\%$

C. $33\frac{2}{9}\%$

D. $22\frac{2}{9}\%$



Q6 Mathematics

The value of $39 \div \{6 \times (\frac{6}{7} \text{ of } \frac{7}{8})\}$ is:

A. $\frac{23}{3}$

B. $\frac{25}{3}$

C. $\frac{26}{3}$

D. $\frac{28}{3}$



Q7 Mathematics

Which of the following statements is true about the nature of roots for the equation $2x^2 + 9x + 15 = 0$?

A. Both roots are imaginary or non-real



B. One root is positive real and one is negative real

C. Both roots are positive real

D. Both roots are negative real



Q8 Mathematics

The present ages of two persons are 46 years and 60 years, respectively. If after 'n' years, the ratio of their ages is 4: 5, then the value of 'n' is:

A. 13

B. 12

C. 11

D. 10

**Q9** Mathematics

The LCM of the numbers 36, 54, 72 and 96 is:

A. 1064

B. 964

C. 864



D. 764

Q10 Mathematics

Three numbers are in the ratio 4: 5: 7, and their LCM is 5600. Their HCF is:

A. 10

B. 20

C. 30

D. 40

**Q11** Mathematics

The value of $(0.1 \times 0.001 \times 0.0001 \times 10^6)$ is:

A. 100

B. 1

C. $\frac{1}{100}$ D. $\frac{1}{10}$ 

Q12 Mathematics

The volumes of two spheres are in the ratio 216 : 125. The ratio of their surface areas is:

- A. 9 : 4
- B. 36 : 25
- C. 16 : 9
- D. 25 : 9



Q13 Mathematics

The value of $\sec A (1 - \cos A) (\operatorname{cosec} A + \cot A)$ is:

- A. $\cot A$
- B. $\tan A$
- C. $\operatorname{cosec} A$
- D. $\sec A$



Q14 Mathematics

In a competitive exam, 3 marks are to be awarded for every correct answer and for every wrong answer, 1 mark will be deducted. Sindhu scored 80 marks in this exam. Had 4 marks been awarded for each correct answer and 2 marks deducted for each incorrect answer, Sindhu would have scored 90 marks. If Sindhu attempted all the questions, then the number of questions in the test are:

- A. 70
- B. 60
- C. 55
- D. 50



Q15 Mathematics

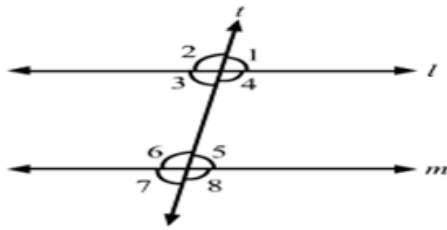
The sum of the present ages of A and B is 30 years. The ratio of their ages after 5 years will be 3 : 2. The present age of A is:

- A. 39 years
- B. 29 years
- C. 19 years
- D. 11 years



Q16 Mathematics

In the given figure, $l \parallel m$ and t is a transversal. If $\angle 1$ and $\angle 2$ are in the ratio $4 : 11$, the measures of the angles $\angle 7$ and $\angle 8$, respectively, are:



A. 65° and 115°

B. 132° and 48° ✓

C. 110° and 70°

D. 87° and 93°

Q17 Mathematics

If a certain sum becomes two times itself in 6 years at compound interest in case of annual compounding, then the number of years in which it will become eight times of itself at the same rate of interest under annual compounding is:

A. 12 years

B. 24 years

C. 18 years ✓

D. 36 years

Q18 Mathematics

Solutions for the equation $11a^2 + 18a + 7 = 0$ are:

A. $-1, 2$

B. $-2, \frac{-7}{11}$

C. $-1, \frac{-7}{11}$ ✓

D. $-1, -3$



Q19 Mathematics

In a quadrilateral ABCD, if the sum of angles $\angle B$ and $\angle D$ be 150° while angles $\angle A$ and $\angle C$ are in ratio $4 : 3$, then the measure of $\angle C$ will be:

A. 210°

B. 150°

C. 90°



D. 120°

Q20 Mathematics

The value of $36^2 \div 9^2 + 4^2$ is:

A. 32



B. 36

C. 49

D. 25

Q21 Mathematics

A shopkeeper allows 4% discount on his marked price. If the cost price of an article is ₹ 120 and he has to make a profit of 10%, then his marked price must be:

A. ₹127.50

B. ₹137.50



C. ₹120.50

D. ₹117.50

Q22 Mathematics

If $9x = 55^2 - 35^2$, then the value of x is:

A. 500

B. 400

C. 300

D. 200



Q23 Mathematics

A man goes to his office from his house at the speed of 5 km/h and returns to his house using the same route at the speed of 20 km/h. The average speed during the journey is:

- A. 6 km/h
- B. 12 km/h
- C. 10 km/h
- D. 8 km/h



Q24 Mathematics

The area of a square having side 15 cm is:

- A. 525 cm^2
- B. 425 cm^2
- C. 325 cm^2
- D. 225 cm^2



Q25 Mathematics

The third proportional of 3.6 and 1.2 is:

- A. 0.40
- B. 0.60
- C. 0.80
- D. 0.90



Mathematics

25 Questions · Answer Key

Q1 Mathematics

In $\triangle MNO$, $\angle N = \angle O$ and $NO = 12$ cm, $MO = 10$ cm and MP be the altitude, then the length of MP is:

A. 3 cm

B. 8 cm

C. 11 cm

D. 10 cm

Q2 Mathematics

The value of $(\operatorname{cosec} x + \cot x + 1)(\sec x - \tan x - 1)$ is:

A. -1

B. 0

C. 1

D. -2

Q3 Mathematics

A man saves 30% of his monthly income. If his monthly income increases by 10%, then he saves 20% more than the previous savings. The percentage increase in his expenditure is _____ (rounded off to one decimal place).

A. 5.7%

B. 6.8%

C. 7.3%

D. 4.8%

Q4 Mathematics

Find the surface area of a sphere of radius 3.5 cm.

A. 210 cm^2 B. 142 cm^2 C. 154 cm^2 D. 120 cm^2 

Q5 Mathematics

10 years ago, the ratio of the ages of A and B was 5: 9. 15 years from now, the ratio of their ages will be 15: 17. What will be A's age 15 years from now?

A. 38 years

B. 30 years



C. 26 years

D. 35 years

Q6 Mathematics

The area of a triangle having base 9 cm and height 16 cm is:

A. 92 cm^2

B. 82 cm^2

C. 72 cm^2



D. 62 cm^2

Q7 Mathematics

The quadratic equation with real coefficients which has real roots 4 and -5 is:

A. $x^2 + x - 20 = 0$



B. $x^2 - 5x - 24 = 0$

C. $x^2 - 4x - 20 = 0$

D. $x^2 - x - 30 = 0$

Q8 Mathematics

The cost price of an article is ₹5,000. What should the selling price of the article be so that a profit of 25% is earned?

A. ₹8,250

B. ₹7,250

C. ₹6,250



D. ₹5,250



Q9 Mathematics

Three years ago, a man was six times as old as his grandson. Three years later, his age will be 6 more than four times the age of the grandson. The present age of the grandson is:

A. 12 years

B. 10 years

C. 15 years



D. 8 years

Q10 Mathematics

A person covers certain distance in 8 hours at a speed of 6 km/h and some more distance in 10 hours at a speed of 4 km/h. Find his average speed for the entire distance covered.

A. $6\frac{8}{9}$ km/h

B. $5\frac{8}{9}$ km/h

C. $4\frac{8}{9}$ km/h



D. $3\frac{8}{9}$ km/h

Q11 Mathematics

Express $0.4\overline{35}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{430}{991}$

B. $\frac{425}{990}$

C. $\frac{456}{991}$

D. $\frac{431}{990}$



Q12 Mathematics

The listed price of an article is ₹200. A customer purchases it at ₹150 after two successive discounts. If one discount is 10%, then the other discount percentage (rounded off to two decimal places) is:

A. 12.5%

B. 11.11%

C. 16.66%



D. 20%

Q13 Mathematics

If $\sqrt{\left(1 - \frac{99}{2500}\right)} = \frac{49}{\sqrt{x}}$, then the value of x is:

A. 2500



B. 50

C. 2401

D. 49

Q14 Mathematics

The HCF of the numbers 310, 208 and 180 is:

A. 2



B. 4

C. 6

D. 8

Q15 Mathematics

The value of $(279 \div 31) + (363 \div 33) - (512 \div 16)$ is:

A. -12



B. 9

C. -11

D. 10



Q16 Mathematics

Simplify $(4x - 5y)^2 + (5x + 4y)^2 + (4x + 5y)(4x - 5y)$.

A. $57x^2 + 16y^2$



B. $-58x^2 + 16y^2$

C. $-57x^2 - 16y^2$

D. $58x^2 + 16y^2$

Q17 Mathematics

The cost of a washing machine is 40% less than the cost of a TV. If the cost of the washing machine increases by 18% and that of the TV decreases by 10%, then what is the change in the total cost of 5 washing machines and 2 TVs?

A. Decreases by 6.5%

B. Increases by 6.5%

C. Decreases by 6.4%

D. Increases by 6.8%



Q18 Mathematics

What is the mean of the following distribution?

Marks	10	30	50	70	90
Number of students	17	28	32	24	19

A. 49.2

B. 50



C. 51

D. 52.4



Q19 Mathematics

Suman invested a sum of ₹20,000 at 10% per annum compound interest. If she received an amount of ₹ 26,620 after n years, the value of n is:

A. 3 years



B. 2.8 years

C. 2.5 years

D. 2 years

Q20 Mathematics

Three pipes A, B and C together can fill a tank in 8 hours. Three pipes were opened for 2 hours, after that C was closed. Later A and B fill the remaining part in 9 hours. The number of hours taken by C alone to fill the tank is:

A. 12

B. 13

C. 20

D. 24

**Q21** Mathematics

The largest four-digit number which when divided by 7, 11 and 13 leaves remainder 4 in each case is:

A. 1005

B. 9999

C. 9009

D. 9013

**Q22** Mathematics

If $p + q + r = 13$ and $pq + qr + rp = 30$, then the value of $p^3 + q^3 + r^3 - 3pqr$ is:

A. 1125

B. 1216

C. 1027



D. 1145



Q23 Mathematics

What is the measure of each interior angle of a regular polygon with 10 sides?

A. 144°



B. 156°

C. 180°

D. 174°

Q24 Mathematics

Which of the following statements is true about the nature of roots for the equation

$$x(x + 3) - 8 = 2(x + 3)(x - 3)?$$

A. Roots are real and equal

B. Roots are irrational

C. Two real and distinct roots



D. Two imaginary or non-real roots

Q25 Mathematics

The average weight of all children in a group is 45 kg. If 10 children of average weight 42 kg leave the group and 2 children of average weight 55 kg join the group, then the average weight of the children in the group increases by $1\frac{1}{4}$ kg. The number of children in the group initially was:

A. 38

B. 42

C. 48



D. 52



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The quadratic equation which has real and equal roots $\frac{3}{5}$ is:

A. $5x^2 - 6x + 9 = 0$

B. $x^2 - 6x + 9 = 0$

C. $x^2 - 30x + 3 = 0$

D. $25x^2 - 30x + 9 = 0$ ✓

Q2 Mathematics

The curved surface area of a cylinder is 1848 cm^2 and its base radius is 19.6 cm. The height of the cylinder is:

A. 17 cm

B. 13 cm

C. 14 cm

D. 15 cm ✓

Q3 Mathematics

If $7\sin^2 x + 3\cos^2 x = 4$, and x is acute angle, then the value of $\cot x + \tan x$ will be:

A. $\frac{2}{\sqrt{3}}$

B. $\frac{4}{\sqrt{3}}$ ✓

C. $\frac{5}{\sqrt{3}}$

D. $\frac{7}{\sqrt{3}}$



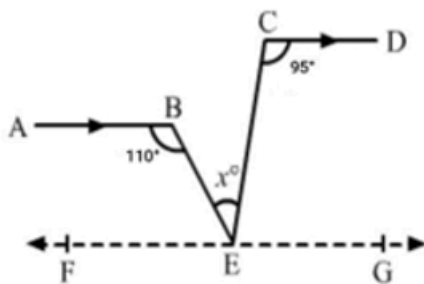
Q4 Mathematics

The value of $[(5^2)^4 \times 5^3] \div 5^9$ is:

- A. 5
- B. 125
- C. 25
- D. $\frac{1}{5}$

**Q5 Mathematics**

In the given figure, lines AB and CD are parallel to line FG. E is a point on the line FG. It is given that $\angle ABE = 110^\circ$, $\angle ECD = 95^\circ$ and $\angle BEC = x^\circ$. The value of x is:



- A. 25°
- B. 60°
- C. 80°
- D. 30°

**Q6 Mathematics**

The population of a village increases at the rate of 10% per annum. If its population 2 years ago was 10,000, the present population is:

- A. 11,000
- B. 12,000
- C. 12,100
- D. 12,400



Q7 Mathematics

A dishonest shopkeeper uses false weights. He gains 30% on purchasing and 30% on selling. His profit percentage is:

- A. 99%
- B. 89%
- C. 79%
- D. 69%

**Q8 Mathematics**

In $\triangle PQR$, if $\angle P : \angle Q : \angle R = 6 : 7 : 5$ then, the measure of $\angle Q$ is:

- A. 55°
- B. 70°
- C. 60°
- D. 75°

**Q9 Mathematics**

The cost of 2 kg of apples and 2 kg of grapes on a day was found to be ₹160. After a month, the cost of 4 kg of apples and 3 kg of grapes was ₹300. Assuming the costs were not changed during the month, the cost of apples (per kg) will be:

- A. ₹120
- B. ₹40
- C. ₹20
- D. ₹60

**Q10 Mathematics**

The sum of two times Manavi's present age and Tanvi's present age is 35 years. Tanvi's father is presently three times as old as Tanvi. Manavi's brother's present age is 6 years more than Manavi's present age. The sum of the present ages of Tanvi's father and Manavi's brother is 56 years. What is the sum of the present ages (in years) of Manavi and Tanvi?

- A. 31
- B. 27
- C. 24
- D. 23



Q11 Mathematics

A man travels from point A to B at a speed of $56\frac{1}{4}$ km/h and returns to A through same route by increasing his speed by $33\frac{1}{3}\%$ of his earlier speed. His average speed (in km/h) for the whole journey is

A. $60\frac{5}{7}$

B. $62\frac{1}{4}$

C. $63\frac{1}{2}$

D. $64\frac{2}{7}$ ✓

Q12 Mathematics

The expenditure of Sudha is 125% more than her savings. If her expenditure decreases by 6% and savings increase by 26.5%, then by what percent does her income increase?

A. 20.5%

B. 18.5%

C. 8%

D. 4% ✓

Q13 Mathematics

The highest common factor of any two distinct prime numbers is:

A. 3

B. 2

C. 1 ✓

D. 0

Q14 Mathematics

A, B and C can complete a piece of work in 20, 24 and 30 days, respectively. The number of days they take to finish it if they work together will be:

A. 6 days

B. 7 days

C. 8 days ✓

D. 5 days



Q15 Mathematics

A team of 30 men is supposed to complete a work in 41 days. After 25 days, 6 more men are employed, and the work is finished one day earlier. By how many days would it have been delayed, if 6 more men were not employed?

- A. 1 day
- B. 2 days
- C. 3 days
- D. 4 days

**Q16** Mathematics

A number when increased by $47\frac{1}{2}\%$, gives 590. The number is:

- A. 700
- B. 600
- C. 500
- D. 400

**Q17** Mathematics

Express $0.1\bar{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

- A. $\frac{7}{45}$
- B. $\frac{8}{45}$
- C. $\frac{6}{49}$
- D. $\frac{5}{49}$

**Q18** Mathematics

Using empirical relation between the mean, median and mode, find the value of the median if the mean is 35 and mode is 140.

- A. 100
- B. 90
- C. 80
- D. 70



Q19 Mathematics

A shopkeeper sells one battery for ₹650 at a profit of 30% and another battery for ₹950 at a loss of 5%. His overall gain or loss percentage is:

A. $9\frac{2}{3}\%$ loss

B. $8\frac{2}{3}\%$ gain

C. $7\frac{2}{3}\%$ loss

D. $6\frac{2}{3}\%$ gain

**Q20** Mathematics

If the 8-digit number $3x5479y4$ is divisible by 88 and the 8-digit number $425139z2$ is divisible by 9, then what is the greatest possible value of $(3x + 2y - z)$?

A. 25

B. 33

C. 35

D. 37

**Q21** Mathematics

The quadratic equation whose roots are 2 and $-\frac{1}{2}$ is:

A. $3x^2 - 3x - 2 = 0$

B. $2x^2 - 5x - 2 = 0$

C. $5x^2 - 3x - 2 = 0$

D. $2x^2 - 3x - 2 = 0$

**Q22** Mathematics

If $(a + b) = 11$ and $(a - b) = 3$ then, the value of $(a^2 + b^2)$ is:

A. 63

B. 70

C. 65

D. 75



Q23 Mathematics

The sum of three consecutive natural numbers is 141. The middle number is:

A. 57

B. 56

C. 47



D. 46

Q24 Mathematics

The value of $5 + (12 - 3 \times 4) - 6 \div 2$ is:

A. -6

B. 6

C. -2

D. 2



Q25 Mathematics

If the radius of a sphere is 5 cm, then its surface area is:

A. $81 \pi \text{ cm}^2$

B. $144 \pi \text{ cm}^2$

C. $121 \pi \text{ cm}^2$

D. $100 \pi \text{ cm}^2$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The sum of two positive numbers is 34 and their product is 64. The positive difference between them is:

- A. 60
- B. 50
- C. 40
- D. 30



Q2 Mathematics

$(x^4 - 625)$ can be factorised as:

- A. $(x^2 + 25)(x^2 + 25)$
- B. $(x^2 - 25)(x^2 - 5)$
- C. $(x - 5)(x + 5)(x^2 + 25)$
- D. $(x + 5)^2(x^2 - 25)$



Q3 Mathematics

The value of $(2^{25} \div 2^{15}) \times 2^4$ is:

- A. 2^{13}
- B. 2^{14}
- C. 2^{11}
- D. 2^{10}



Q4 Mathematics

A merchant purchased an item for ₹1,500. How much should he mark on the item to earn 20% profit after allowing 20% discount?

- A. ₹2,250
- B. ₹2,000
- C. ₹1,800
- D. ₹1,650



Q5 Mathematics

The ratio of the radius of the base to the height of a cylinder is $2 : 1$. If its volume is 4312 cm^3 , then the curved surface area of the cylinder is:

A. 946 cm^2

B. 734 cm^2

C. 616 cm^2 ✓

D. 668 cm^2

Q6 Mathematics

Which of the following statements is true about the nature of roots for the equation $11x^2 + 19x + 8 = 0$?

A. Both roots are imaginary or non-real

B. One root is positive real, and one is negative real

C. Both roots are positive real

D. Both roots are negative real ✓

Q7 Mathematics

The fourth proportional to 0.15, 0.35 and 12 is:

A. 58

B. 48

C. 38

D. 28 ✓

Q8 Mathematics

If the 5-digit number $688xy$ is divisible by 11 and 21, then what is the value of $(8x - 3y + xy)$?

A. 24 ✓

B. 15

C. 13

D. 6



Q9 Mathematics

If $\tan x = \frac{3}{4}$, for $0 < x < 90^\circ$, then the value of $\frac{1 - \sin x}{1 + \sin x}$ will be:

A. $\frac{1}{3}$

B. $\frac{1}{5}$

C. $\frac{1}{2}$

D. $\frac{1}{4}$ ✓

Q10 Mathematics

If $(a - b) = 8$ and $(a^2 + b^2) = 160$, then the value of ab is:

A. 40

B. 48 ✓

C. 36

D. 32

Q11 Mathematics

The sum lent at the rate of 25% per annum simple interest, that produces interest of ₹ 2.00 a day, for a year of 365 days, is:

A. ₹2,820

B. ₹2,920 ✓

C. ₹2,800

D. ₹2,902

Q12 Mathematics

40% of 60% of $\frac{5}{8}$ of a number is 339. The number is:

A. 5260

B. 4260

C. 3260

D. 2260 ✓



Q13 Mathematics

Two trains of lengths 160 m and 90 m are running in the same direction with velocities of 40 km/h and 50 km/h, respectively. The time taken by them to cross each other is:

A. 75 sec

B. 80 sec

C. 95 sec

D. 90 sec

**Q14** Mathematics

The value of $\left\{14 + \left(2\frac{1}{2} + \frac{4}{5} + 1\right)\right\} \times \frac{1}{100}$ is:

A. 1.83

B. 0.183

C. 0.0183

D. 18.3

**Q15** Mathematics

A class of 20 students took a science test. 8 students had an average (arithmetic mean) score of 60. The remaining students had an average score of 40. The average score of the whole class is:

A. 68

B. 48

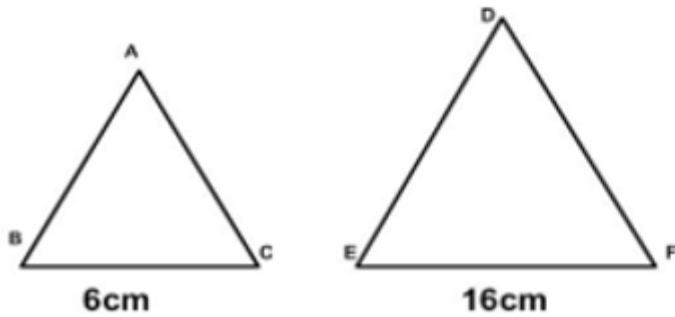
C. 58

D. 40



Q16 Mathematics

In the given figure, if $\triangle ABC$ and $\triangle DEF$ are similar, then the ratio of CA to FD will be:



A. 3 : 8



B. 3 : 4

C. 5 : 7

D. 3 : 7

Q17 Mathematics

Using empirical relation between the mean, median and mode, find the value of the mode if the median is 30 and mean is 25.

A. 60

B. 50

C. 40



D. 30

Q18 Mathematics

The volume of a sphere having radius 6 cm is:

A. $588 \pi \text{ cm}^3$

B. $488 \pi \text{ cm}^3$

C. $388 \pi \text{ cm}^3$

D. $288 \pi \text{ cm}^3$



Q19 Mathematics

Twice the present age of X is 9 years less than thrice the present age of Y. At present, X's father P is twice as old as X, and Y is 9 years younger than her sister Q. If P is 20 years older than Q, then the present age (in years) of Y is:

A. 18

B. 19

C. 21

D. 23

Q20 Mathematics

Which of the following numbers is divisible by 4?

A. 7864534

B. 9876342

C. 8978624

D. 9876754

Q21 Mathematics

Roots of the equation $x^2 = 24 - 10x$ are:

A. 3, -12

B. 2, -12

C. 3, -11

D. 2, -11

Q22 Mathematics

A can complete $\frac{2}{3}$ of a certain work in 12 days and B can complete $\frac{1}{4}$ of the same work in 3 days. Working together, the number of days they will take to finish the work is:

A. $7\frac{1}{5}$ B. $8\frac{1}{5}$ C. $5\frac{1}{5}$ D. $6\frac{1}{5}$ 

Q23 Mathematics

The mode of the observations 20, 23, 25, 30, 20, 31, 32, 35, 20, 41, 42, 43, 20 and 20 is:

A. 40

B. 35

C. 30

D. 20

**Q24** Mathematics

A man bought mangoes at the rate of 12 for ₹900 and sold them at the rate of 9 for ₹1,200. His profit percentage in the transaction is:

A. $99\frac{8}{9}\%$

B. $88\frac{8}{9}\%$

C. $77\frac{7}{9}\%$



D. $66\frac{7}{9}\%$

Q25 Mathematics

The least 3-digit number that is completely divisible by 8 and 12 is:

A. 108

B. 124

C. 120



D. 144



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Two trains M and N cross a pole in 30 seconds and 1 minute 45 seconds, respectively. The length of train M is half the length of train N. The respective ratio of the speed of train M to that of train N is:

- A. 2 : 3
- B. 5 : 4
- C. 7 : 4
- D. 9 : 4



Q2 Mathematics

The average of the prime numbers between 11 and 30 is:

- A. 19.5
- B. 19.6
- C. 20.2
- D. 20.3



Q3 Mathematics

Which of the following is a pair of co-prime numbers?

- A. 81, 16
- B. 52, 24
- C. 455, 49
- D. 363, 77



Q4 Mathematics

Rajani borrowed an amount of ₹ 11,550 at an interest rate of 10% per annum, compounded annually. She repaid the entire amount with interest in two equal instalments, the instalments being paid at the end of the first and the second years from the date of borrowing. What is the value of each instalment, if interest is computed on reducing balance?

- A. ₹4,455
- B. ₹6,655
- C. ₹5,775
- D. ₹7,755



Q5 Mathematics

In quadrilateral PQRS, the bisectors of $\angle R$ and $\angle S$ meet at the point T (inside the quadrilateral) and $\angle STR = 87.5^\circ$. If the ratio of $\angle P$ to $\angle Q$ is $2 : 3$, then what is the difference between the measures of $\angle Q$ and $\angle P$?

A. 35°



B. 40°

C. 45°

D. 25°

Q6 Mathematics

The value of $5 + 12 \div 4 - 2 \times (1 + 3)$ is:

A. -1

B. 1

C. 0



D. 2

Q7 Mathematics

A man buys a car for ₹2,50,000 and spends ₹30,000 on its repairs. If he sells the car for ₹3,50,000, then his profit percentage is:

A. 33.33%

B. 32%

C. 28%

D. 25%

**Q8 Mathematics**

The fourth proportional of 17, 32, and 51 is:

A. 32

B. 64

C. 72

D. 96



Q9 Mathematics

The ratio of the ages of A and B is 5: 9. After 7 years, B's age will be 52 years. Six years ago, A's age was:

- A. 44 years
- B. 35 years
- C. 24 years
- D. 19 years



Q10 Mathematics

One pipe can fill a tank three times as fast as another pipe. Together the two pipes can fill the tank in 32 minutes. The slower pipe alone will be able to fill the tank in _____ minutes.

- A. 128
- B. 64
- C. 144
- D. 96



Q11 Mathematics

If $x+y = 18$, Product of x and y is 77, then which of the following pairs of numbers can be the values of x and y , respectively?

- A. 12 and 6
- B. 11 and 7
- C. 9 and 9
- D. 8 and 10



Q12 Mathematics

The number of boys and girls in a class are in the ratio 6 : 5. The number of boys is 9 more than the number of girls. The total class strength(only boys and girls are in the class) is:

- A. 99
- B. 89
- C. 100
- D. 129



Q13 Mathematics

The diameter of the base of a cylinder is 3 cm and its height is 14 cm. The volume of the cylinder is:

A. 99 cm^3



B. 79 cm^3

C. 89 cm^3

D. 69 cm^3

Q14 Mathematics

Which of the following has NO pair of parallel sides?

A. Rectangle

B. Trapezium

C. Kite



D. Rhombus

Q15 Mathematics

The number 678954321 is divisible by which of the following?

A. 2

B. 11

C. 6

D. 3



Q16 Mathematics

The arithmetic mean of the observations 39, 49, 59, 60, 70, 80, 90, 93 and 90 is:

A. 79

B. 78

C. 76

D. 70



Q17 Mathematics

The value of $\frac{9}{10} \div \left(\frac{4}{5} + \frac{1}{10}\right)$ is:

A. 1



B. 0

C. $\frac{81}{100}$

D. $\frac{1}{10}$

Q18 Mathematics

The sum of five consecutive numbers is 240. The sum of the first and last numbers is:

A. 126

B. 116

C. 106

D. 96



Q19 Mathematics

The hypotenuse of a right-angled triangle is 2 more than twice of one of the sides, while the third side is 13 more than half of the hypotenuse. The length of the median to the hypotenuse is:

A. 15

B. 18

C. 17



D. 20

Q20 Mathematics

The two numbers whose mean proportional is 14 and third proportional is 4802 are:

A. 8 and 24

B. 7 and 28

C. 4 and 49

D. 2 and 98



Q21 Mathematics

The greatest number which divides 72 and 122 leaving remainders 3 and 7, respectively, is:

A. 17

B. 23



C. 26

D. 29

Q22 Mathematics

Which of the following two successive discounts are equivalent to a single discount of 84%?

A. 10% and 90%

B. 20% and 80%



C. 30% and 70%

D. 40% and 60%

Q23 Mathematics

The perimeter of a circle whose diameter is 50 cm is:

A. 50π cm



B. 40π cm

C. 30π cm

D. 20π cm

Q24 Mathematics

Roots of the equation $x^2 + 2x - 6 = 0$ are:

A. $-1 \pm \sqrt{5}$

B. $-3 \pm \sqrt{7}$

C. $-2 \pm \sqrt{7}$

D. $-1 \pm \sqrt{7}$



Q25 Mathematics

The average of 41 numbers is 62. The average of the first 18 numbers is 65.5 and the average of the last 24 numbers is 61.5. If the 18th number from the beginning is excluded, then what is the average of the remaining numbers?

A. 60.5

B. 60.725



C. 61.325

D. 61.625



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The value of $(11^0 + 21^0 - 7^0 + 3^0) \times 5^0$ is:

A. 1

B. 0

C. 3

D. 2



Q2 Mathematics

A dishonest dealer professes to sell his goods at cost price but he uses a weight of 800 g for a weight of 1 kg. His profit percentage is:

A. 55%

B. 45%

C. 35%

D. 25%



Q3 Mathematics

Which of the following statements is true about the nature of roots for the equation $x^2 + x + 12 = 0$?

A. Both roots are imaginary or non-real



B. One root is imaginary, and one is real

C. Both roots are positive real

D. Both roots are negative real

Q4 Mathematics

Two times the present age of Anu is 6 years more than the present age of Bina. The present age of Anu's mother (M) is three times the present age of Anu, and Bina is 5 years younger than her sister (S). If the sum of the present ages of M and S is 64 years, then Anu's present age (in years) is:

A. 13



B. 14

C. 15

D. 17



Q5 Mathematics

A can complete a certain work in the same time in which B and C together can complete it. If A and B together could complete it in 20 days and C alone in 60 days, then B alone could complete the work in:

A. 60 days



B. 72 days

C. 65 days

D. 70 days

Q6 Mathematics

'A' and 'B' invest ₹ 30,000 and ₹ 24,000, respectively, for one year. If they get a profit of ₹ 13,500, then the share of 'B' in the profit is:

A. ₹6,000



B. ₹7,500

C. ₹9,000

D. ₹9,450

Q7 Mathematics

The number of prime numbers lying between 400 and 430 is:

A. 5

B. 4



C. 6

D. 3

Q8 Mathematics

The area of a triangle having base 4 cm and height 7 cm is:

A. 32 cm²

B. 28 cm²

C. 24 cm²

D. 14 cm²



Q9 Mathematics

The quadratic equation for which, sum of the roots is $(-\frac{3}{5})$ and product of the roots is $\frac{2}{5}$, is:

A. $5x^2 - 2x + 7 = 0$

B. $5x^2 - 3x + 2 = 0$ ✓

C. $5x^2 - 7x + 2 = 0$

D. $5x^2 - x + 1 = 0$

Q10 Mathematics

The LCM of the numbers 2.5 and 0.175 is:

A. 1.75

B. 0.0175

C. 175

D. 17.5 ✓

Q11 Mathematics

It is given that, $\triangle ABC \cong \triangle FDE$ and $AB = 6$ cm, $\angle B = 60^\circ$ and $\angle A = 70^\circ$, then which of the following is true?

A. $DF = 6$ cm, $\angle F = 50^\circ$

B. $DF = 6$ cm, $\angle E = 50^\circ$ ✓

C. $DE = 5$ cm, $\angle E = 50^\circ$

D. $DE = 6$ cm, $\angle D = 40^\circ$

Q12 Mathematics

The price of fuel decreases by 15%, 12% and 10% in three successive months, but increases by 25% in the fourth month. What is the percentage increase/decrease in the price of fuel in the fourth month as compared to its original price?

A. Decreases by 12%

B. Increases by 10%

C. Decreases by 15.85% ✓

D. Increases by 15.75%



Q13 Mathematics

The area of a rectangle whose length is 13 cm and breadth is 12 cm is:

- A. 186 cm^2
- B. 176 cm^2
- C. 166 cm^2
- D. 156 cm^2



Q14 Mathematics

Factorise ($x^2 - 16a^2 + 24ab - 9b^2$).

- A. $(x + 4a + 3b)(x + 4a - 3b)$
- B. $(x - 4a - 3b)(x + 4a - 3b)$
- C. $(x + 4a + 3b)(x - 4a + 3b)$
- D. $(x - 4a + 3b)(x + 4a - 3b)$



Q15 Mathematics

If 39 less than 6 times a certain number is 339, then the number is:

- A. 83
- B. 73
- C. 63
- D. 53



Q16 Mathematics

If a shopkeeper sells 25 articles at ₹ 45 per article after giving 10% discount and earns 50% profit. If the discount is not given the percentage profit gained (rounded off to two decimal places) is:

- A. 66.67%
- B. 65.56%
- C. 56.65%
- D. 55.55%



Q17 Mathematics

Express $0.\overline{3}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{2}{3}$

B. $\frac{3}{4}$

C. $\frac{2}{5}$

D. $\frac{1}{3}$ ✓

Q18 Mathematics

The product of two positive numbers is 500. If the first number is five times of the second number, then the sum of the two numbers is:

A. 90

B. 80

C. 70

D. 60 ✓

Q19 Mathematics

Five years ago, the average age of A, B and C was 35 years. Five years from now, the average age of A and C will be 48 years. What will be the age (in years) of B, three years from now?

A. 34

B. 35

C. 37 ✓

D. 38

Q20 Mathematics

The average of five numbers is 15. If four of the numbers are 10, 12, 14 and 18, then the fifth number is:

A. 23

B. 36

C. 31

D. 21 ✓



Q21 Mathematics

A and B together can complete a piece of work in 5 days, while X and Y together can complete the same work in 20 days. The number of days A, B, X and Y together will take to complete it is:

A. 4 days



B. 3 days

C. 5 days

D. 6 days

Q22 Mathematics

The median of the observations 20, 23, 25, 30, 20, 31, 32, 35, 20, 41, 42, 43, 20, 20 and 20 is:

A. 28

B. 26

C. 25



D. 23

Q23 Mathematics

The simple interest on a sum for 3 years is two-fifth of the sum. The rate of interest per annum is:

A. $\frac{40}{3}\%$



B. $\frac{20}{3}\%$

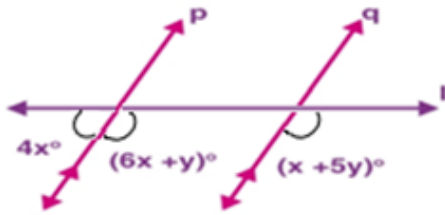
C. $\frac{3}{40}\%$

D. $\frac{10}{3}\%$



Q24 Mathematics

In the given figure, $p \parallel q$ and l is a transversal cutting p and q with angles as specified. The value of $(5x - y)$ is:



A. 60



B. 40

C. 96

D. 116

Q25 Mathematics

$\frac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A}$ is equal to:

A. $\tan A$



B. $\sin A$

C. $\operatorname{cosec} A$

D. $\cot A$



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Mathematics

25 Questions • Answer Key

Q1 Mathematics

The LCM and the HCF of two numbers are given as 459 and 3, respectively. If one number is 51, then find the other number.

- A. 33
- B. 21
- C. 37
- D. 27



Q2 Mathematics

A man covers equal distances at the speeds of 5 km/h, 8 km/h and 6 km/h. His average speed for the entire journey is:

- A. $5\frac{6}{59}$ km/h
- B. $6\frac{6}{59}$ km/h
- C. $7\frac{6}{59}$ km/h
- D. $8\frac{6}{59}$ km/h



Q3 Mathematics

Which of the following represents the equation $(x + 2)^3 = x(x^2 - 1)$ in standard form?

- A. $4x^2 + 10x + 7 = 0$
- B. $6x^2 + 13x + 8 = 0$
- C. $6x^2 + 11x + 6 = 0$
- D. $x^2 + 12x + 8 = 0$



Q4 Mathematics

If each interior angle of a regular polygon is 144° , then the number of its sides is:

- A. 12
- B. 10
- C. 8
- D. 14



Q5 Mathematics

One-third of a certain journey is covered at the speed of 25 km/h, one-fourth at 30 km/h and the rest at 50 km/h. The average speed for the whole journey is:

A. 35 km/h

B. $33\frac{1}{6}$ km/h

C. $33\frac{1}{3}$ km/h ✓

D. $30\frac{1}{2}$ km/h

Q6 Mathematics

The surface area of a sphere is $196\pi\text{ cm}^2$. The volume of the sphere is:

A. $\frac{1572\pi}{3}\text{ cm}^3$

B. $\frac{1472\pi}{3}\text{ cm}^3$

C. $\frac{1372\pi}{3}\text{ cm}^3$ ✓

D. $\frac{1272\pi}{3}\text{ cm}^3$

Q7 Mathematics

If the speed of a vehicle decreases by 10 km/h, it takes 2 hours more than what it usually takes to cover a distance of 1800 km. The time it usually takes is:

A. 18 hours ✓

B. 17 hours

C. 19 hours

D. 10 hours

Q8 Mathematics

What is the value of $222.22 + 22.22 + 12 + 0.22 + 0.02$?

A. 256.08

B. 256.68 ✓

C. 255.68

D. 256.86



Q9 Mathematics

If the volume of a cube is 512 cm^3 , then the measure of the main diagonal of the cube will be:

A. $8\sqrt{3} \text{ cm}$



B. $14\sqrt{3} \text{ cm}$

C. $7\sqrt{3} \text{ cm}$

D. $17\sqrt{3} \text{ cm}$

Q10 Mathematics

How much annual instalment will discharge a debt of ₹9,600 in 5 years at 10% simple interest per annum?

A. ₹ 1,450

B. ₹ 1,500

C. ₹ 1,550

D. ₹ 1,600



Q11 Mathematics

The value of 597×603 is:

A. 659991

B. 559991

C. 459991

D. 359991



Q12 Mathematics

Find the value of $\frac{\tan^2 60^\circ + \cot^2 30^\circ}{\tan^2 20^\circ - \sec^2 20^\circ} - \frac{\sin 90^\circ + \cos 0^\circ}{\operatorname{cosec}^2 20^\circ - \cot^2 20^\circ}$.

A. -8



B. -2

C. 4

D. -4



Q13 Mathematics

Which of the following is divisible by 2, 3, and 5?

A. 2240

B. 14175

C. 54332

D. 3150



Q14 Mathematics

The sum of twice a number and three times of 52 is 342. What is the sum of four times the number and two times 52?

A. 776

B. 676

C. 576

D. 476



Q15 Mathematics

The value of $6 \times 7 - \{9 \div 3 + [3 \times (5 - 2)]\}$ is:

A. 11

B. 24

C. 45

D. 30



Q16 Mathematics

The sum of the present ages of A and B is 80 years. If the ratio of their ages after 8 years will be 17: 15, then the present age of B is:

A. 55 years

B. 45 years

C. 35 years

D. 37 years



Q17 Mathematics

The mode of the observations 2, 6, 3, 9, 5, 6, 7, 8, 4, 6, 10, 6 and 11 is:

A. 11

B. 10

C. 7

D. 6



Q18 Mathematics

A shopkeeper has the following 2 schemes.

(I) Two successive discounts of 15% and 20%

(II) Buy 5, get 4 free

The single discount from each scheme, respectively, is:

A. 35%, 40%

B. 30%, 45%

C. 32%, 44.44%



D. 33.33%, 45%

Q19 Mathematics

A boy can complete a piece of work alone in 10 days, but with the help of his friend he can complete it in 6 days. In how much time will his friend be able to complete the same piece of work alone?

A. 4 days

B. 8 days

C. 15 days



D. $4\frac{1}{2}$ days

Q20 Mathematics

If $x - \frac{1}{x} = 6$, then the value of $x^3 - \frac{1}{x^3}$ is:

A. 534

B. 434

C. 334

D. 234



Q21 Mathematics

The mean proportional between $8+4\sqrt{2}$ and $6-3\sqrt{2}$ is:

A. $4\sqrt{6}$

B. $3\sqrt{6}$

C. $2\sqrt{6}$ ✓

D. $\sqrt{6}$

Q22 Mathematics

If the ratio of two numbers is 5: 7, and their HCF is 8, then their LCM is:

A. 480

B. 380

C. 280 ✓

D. 580

Q23 Mathematics

The mean proportional of 25 and 36 is:

A. 36

B. 30 ✓

C. 25

D. 60

Q24 Mathematics

If the cost price of an article is ₹3,200 and its selling price is ₹4,700, then the profit percentage is:

A. $56\frac{7}{8}\%$

B. $56\frac{8}{9}\%$

C. $46\frac{7}{8}\%$ ✓

D. $46\frac{8}{9}\%$



In which of the following quadrilaterals do diagonals NOT intersect at 90° ?

A. Rhombus

B. Square

C. Parallelogram



D. Kite

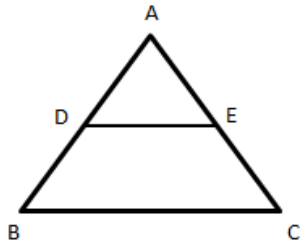


Mathematics

25 Questions • Answer Key

Q1 Mathematics

In the given figure, in $\triangle ABC$, $DE \parallel BC$, $AD = 7$ cm, $AE = 3.5$ cm and $DB = 6$ cm. What is the value of AC ? [Note: Diagram is not drawn to scale or measurements indicated.]



A. 3 cm

B. 4.5 cm

C. 6.5 cm



D. 4 cm

Q2 Mathematics

If the cost price of 24 pencils is equal to the selling price of 16 pencils, then the gain percentage is _____.

A. 25%

B. 50%



C. 42%

D. 38%

Q3 Mathematics

What is the value of $5^5 \times (125)^{-\frac{2}{3}} \times (25)^{-\frac{1}{2}}$?

A. 5

B. $\frac{1}{25}$ C. $\frac{1}{5}$

D. 25



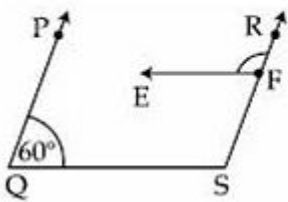
Q4 Mathematics

One-third of a journey is covered at a speed of 25 km/h, the next one-third of the journey is covered at a speed of 40 km/h and the remaining journey is covered at a speed of 50 km/h. The average speed (in km/h, rounded off to 1 decimal place) for the entire journey is:

- A. 25.3
- B. 30.3
- C. 33.3
- D. 35.3

**Q5 Mathematics**

In the given figure, $QS \parallel EF$ and $RS \parallel PQ$. If $m\angle PQS = 60^\circ$, then $m\angle RFE = ?$



- A. 140°
- B. 120°
- C. 110°
- D. 130°

**Q6 Mathematics**

Father's age is three times the sum of ages of his two children. After 6 years, his age will be twice the sum of the ages of both the children. The age of the father is:

- A. 52 years
- B. 54 years
- C. 50 years
- D. 36 years



Q7 Mathematics

The HCF and the LCM of two numbers are 1080 and 30240, respectively. If one of the numbers is 4320, then the other number is _____.

A. 1080

B. 8640

C. 7560



D. 30240

Q8 Mathematics

Which of the following describes the nature of the roots of the quadratic equation $4x^2 - 7\sqrt{3}x + 12 = 0$?

A. No real roots



B. Two equal roots

C. Two distinct real roots

D. One real root and one imaginary root

Q9 Mathematics

A train travels 20 km in 24 minutes. If its speed is increased by 5 km/h, the time taken by it to cover the same distance will be _____ minutes.

A. $27\frac{9}{11}$

B. $21\frac{9}{11}$



C. $26\frac{9}{11}$

D. $29\frac{9}{11}$

Q10 Mathematics

The sum of two numbers is 9 and the sum of their squares are 41. The numbers are:

A. 7, 2

B. 6, 3

C. 5, 4



D. 1, 8



Q11 Mathematics

Find the value of $\sec 33^\circ \operatorname{cosec} 57^\circ - \cot 57^\circ \tan 33^\circ + \cot 47^\circ \cot 43^\circ$.

A. 0

B. 1

C. 2



D. -1

Q12 Mathematics

The sum of five consecutive even numbers is 2720. The sum of the third and fifth numbers is:

A. 1392

B. 1292

C. 1192

D. 1092



Q13 Mathematics

If 63 chocolates are to be divided between A and B in the ratio 4 : 5, then how many chocolates will B get?

A. 28

B. 49

C. 27

D. 35



Q14 Mathematics

The sides of a rectangle are in the ratio 8 : 10 and its perimeter is 90 cm. The area of this rectangle is:

A. 550 cm^2

B. 520 cm^2

C. 450 cm^2

D. 500 cm^2



Q15 Mathematics

Simplify $\frac{12^3 \times 6^2 \times 8}{4^5 \times 3^5}$.

A. 2



B. 4

C. 8

D. 1

Q16 Mathematics

The ratio of the sum of two numbers and their difference is 8: 3. The ratio of the greater number to the smaller number is:

A. 12: 7

B. 7: 12

C. 11: 5



D. 5: 11

Q17 Mathematics

The simple interest on a principal amount is ₹192 for a period of 2 years at the rate of 8% per annum. The principal amount is:

A. ₹1,000

B. ₹1,200



C. ₹1,400

D. ₹1,600

Q18 Mathematics

The length of each of the two equal sides of an isosceles triangle is 5 cm each and the length of its base is 8 cm. The area (in cm^2) of the triangle is:

A. 9

B. 12



C. 15

D. 18



Q19 Mathematics

A man sells a cupboard at a certain price S , 20% of which is his profit. If the price at which he buys the cupboard increases by 10% and he sells it at a 4% higher price than S , then his profit percentage will be:

A. 18.18%



B. 21.8%

C. 22.7%

D. 23.4%

Q20 Mathematics

$(34)^3$ is equal to:

A. 29304

B. 39204

C. 39304



D. 40304

Q21 Mathematics

The sum of the ages of a man and his son is 68 years. After 5 years, the age of man will be five times the age of his son. The present age of the son is:

A. 10 years

B. 9 years

C. 8 years



D. 7 years

Q22 Mathematics

If $1.5x = 0.02y$, then the value of $\frac{1}{\left(\frac{y+x}{y-x}\right)}$ is _____.

A. $\frac{370}{38}$

B. $\frac{37}{380}$

C. $\frac{37}{38}$



D. $\frac{38}{37}$



Q23 Mathematics

If a person covers 10.5 km in 2 hours, then the distance covered by him at the same speed in 5 hours will be:

A. 25.50 km

B. 26.25 km



C. 26.20 km

D. 25.75 km

Q24 Mathematics

The arithmetic mean of the observations 3, 6, 8, 10, 12, 14, 18, 24 and 31 is:

A. 17

B. 16

C. 15

D. 14



Q25 Mathematics

The sum of the first five prime numbers is:

A. 28



B. 29

C. 27

D. 26



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A man buys a table for ₹2,800 and sells it at a loss of 30%. The selling price (in ₹) of the table is _____.

A. 1,440

B. 1,960



C. 1,890

D. 1,770

Q2 Mathematics

The value of $\sin^2 \theta + \cos^2 \theta - (\sec^2 \theta - \tan^2 \theta) + \tan \theta \cos \theta - \sin \theta$ is _____.

A. $4\sin\theta\cos\theta$ B. $\sec^2 \theta$ C. -1

D. 0



Q3 Mathematics

The ratio of Kamal's to Kiran's age is 4 : 5. Kamal will be 30 years old after 6 years. What is the present age of Kiran?

A. 30 years



B. 24 years

C. 40 years

D. 28 years

Q4 Mathematics

The number of factors of any prime number is:

A. 4

B. 3

C. 2



D. 1



Q5 Mathematics

The total surface area of a solid hemisphere is 42 cm^2 . Its radius (in cm) is:

Take $\pi = \frac{22}{7}$

A. $\frac{7}{\sqrt{11}}$



B. $\frac{7\sqrt{2}}{\sqrt{11}}$

C. $\frac{7\sqrt{2}}{\sqrt{22}}$

D. $\frac{7\sqrt{3}}{\sqrt{22}}$

Q6 Mathematics

A man walking at a speed of 10 km/h crosses a bridge in $7\frac{1}{2}$ minutes. The length of the bridge is _____ metres.

A. 1500

B. 1250



C. 1480

D. 1560

Q7 Mathematics

The value of $\{1 + (1 - 2)^{-1} + 2 - (1 - 2)^{-2}\}^2$ is:

A. 1



B. 0

C. 8

D. 9



Q8 Mathematics

Three chairs and two tables cost ₹1,850. Five chairs and three tables cost ₹2,850. Find the cost of two chairs and two tables.

A. ₹700

B. ₹1,700



C. ₹1,400

D. ₹1,300

Q9 Mathematics

The volume (in cm^3) of a solid right circular cylinder whose diameter of base is 7 cm and height is 20 cm is _____. (Use $\pi = \frac{22}{7}$)

A. 3080

B. 980

C. 770



D. 1440

Q10 Mathematics

The correct expression of $8.\overline{46}$ in the fractional form is _____.

A. $\frac{846}{99}$ B. $\frac{84}{99}$ C. $\frac{838}{99}$ D. $\frac{83}{99}$ **Q11 Mathematics**

Simplify $x^2 + y^2 + (x - y)^2 + (x + y)^2 - 20$:

A. $3x^2 + 3y^2 - 20$ B. $3x^2 + 3y^2 + 20$ C. $3x^2 - 3y^2 - 20$ D. $3x^2 - 3y^2 + 20$ 

Q12 Mathematics

100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters from the English alphabets in the surnames was obtained as follows.

Number of letters	1 – 4	4 – 7	7 – 10	10 – 13	13 – 16	16 – 19
Number of surnames	6	30	40	16	4	4

The median number of letters in the surnames is:

- A. 8.02
- B. 7.09
- C. 7.04
- D. 8.05

**Q13 Mathematics**

Tanvi saves ₹5,000 from her salary every month after spending 80% of her monthly salary. Tanvi's salary is:

- A. ₹20,000
- B. ₹30,000
- C. ₹25,000
- D. ₹35,000

**Q14 Mathematics**

If $13 : 12 :: x : 60$ then, the value of x is:

- A. 65
- B. 78
- C. 56
- D. 91

**Q15 Mathematics**

Which of the following describes the nature of the roots of the quadratic equation $5x^2 - 16x + 10 = 0$?

- A. No real roots
- B. Two equal roots
- C. Two distinct real roots
- D. One real root and one imaginary root



Q16 Mathematics

The mean literacy rate of a few cities as displayed in the following distribution is:

Literacy rate in %	No. of cities
25-35	6
35-45	5
45-55	4
55-65	1

A. 28

B. 32

C. 36

D. 40

**Q17** Mathematics

A pipe can fill an empty tank in 15 minutes while another pipe can empty the same tank, when completely full, in 20 minutes. How much time (in minutes) will it take to completely fill the empty tank if both the pipes are opened simultaneously?

A. 54

B. 56

C. 60



D. 48

Q18 Mathematics

Mohan borrows a sum of ₹2,20,000 at the rate of 8% per annum simple interest. At the end of the first year, he repays ₹27,600 towards return of principal amount borrowed. If Mohan clears all pending dues at the end of the second year, including interest payment that accrued during the first year, how much does he pay at the end of the second year?

A. ₹2,25,392



B. ₹2,27,600

C. ₹2,26,800

D. ₹2,25,512



Q19 Mathematics

A person sells a sofa at a certain price. If he sold it at 60% of this price, then there will be a loss of 20%. The percentage profit when sofa was sold at the original selling price is:

A. $15\frac{1}{2}\%$

B. $12\frac{1}{2}\%$

C. $33\frac{1}{3}\%$ ✓

D. 12%

Q20 Mathematics

If the number of sides of a regular polygon is 12, then the measure of each exterior angle is:

A. 48°

B. 36°

C. 30° ✓

D. 40°

Q21 Mathematics

The value of $72 \div (9 - 7)$ of $3 - 6 \times 2 + 8$ is:

A. 104

B. 44

C. 8 ✓

D. 68

Q22 Mathematics

The L.C.M. of 70, 28 and 42 is _____.

A. 700

B. 280

C. 420 ✓

D. 116



Q23 Mathematics

The discriminant of the equation $4x^2 - 5x - 3 = 0$ is:

A. -23

B. 23

C. -73

D. 73



Q24 Mathematics

$16x^2 + 4y^2 + 25z^2 - 16xy + 20yz - 40zx$ is equal to:

A. $(4x + 2y - 5z)^2$

B. $(4x - 2y + 5z)^2$

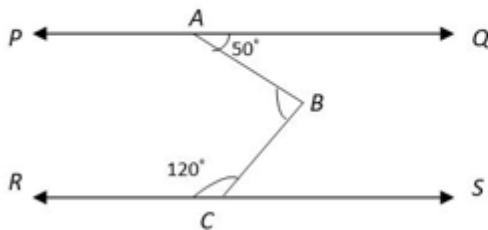
C. $(4x + 2y + 5z)^2$

D. $(4x - 2y - 5z)^2$



Q25 Mathematics

What is the measure of $\angle ABC$ in the given figure, given that $PQ \parallel RS$?



A. 90°

B. 140°

C. 110°

D. 70°



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The sum of the present ages of Bunty and Bubbly is 32 years. After 2 years, Bunty's age will be three times that of Bubbly. Bunty's present age (in years) is:

A. 25



B. 20

C. 13

D. 7

Q2 Mathematics

A vendor offers successive discounts of 12% and 15% on an article whose marked price is ₹2,000. He earns a profit of 20% in the transaction. The cost price (rounded off to the nearest integer) of the article is:

A. ₹1,247



B. ₹1,297

C. ₹1,347

D. ₹1,397

Q3 Mathematics

Which of the following numbers is a divisible by 8?

A. 1245964

B. 1246864



C. 1247564

D. 1248164

Q4 Mathematics

Find the median of 4, 6, 6, 8, 8, 8, 10, 12.

A. 6

B. 10

C. 8



D. 12



Q5 Mathematics

The volume (in cm^3) of a wire of diameter 2 cm and length 7 m is:

Take $\pi = \frac{22}{7}$

A. 2200



B. 2400

C. 1200

D. 1100

Q6 Mathematics

A person sells an article for ₹1,820 and loses 9%. If he wants to sell it a profit of 9%, the selling price of the article should be:

A. ₹2,080

B. ₹2,180



C. ₹2,280

D. ₹2,480

Q7 Mathematics

Pipe A can fill a tank in 15 minutes, while pipe B can empty the completely filled tank in 20 minutes. Initially, pipe A is opened and after 5 minutes pipe B is also opened. In how much time (in minutes) will the remaining tank be filled completely?

A. 20

B. 30

C. 40



D. 50

Q8 Mathematics

Manganese and aluminium are mixed in the ratio of 2 : 3 to make an alloy. The quantity (in kg) of aluminium required to be melted with 24 kg of manganese is _____.

A. 12

B. 36



C. 48

D. 72



Q9 Mathematics

The internal surface area (in m^2) of an open cuboidal tank whose internal length, internal breadth, and internal height are given as 6 m, 4 m, and 3 m, respectively, is:

A. 72

B. 84



C. 108

D. 124

Q10 Mathematics

The value of $\sqrt{0.04} + \sqrt{6.25} + \sqrt{12.25} - 8.2$ is _____.

A. 2

B. 2.2

C. -2



D. -2.2

Q11 Mathematics

Find the value of y if $\frac{1}{(125)^{-y}} = \frac{1}{5^{-4y+1}}$.

A. $\frac{1}{3}$

B. -1

C. 5

D. 1

**Q12 Mathematics**

The value of $(x - y)(x + y) + (y - z)(y + z) + (z + x)(z - x)$ is:

A. $x + y + z$

B. 0

C. $x^2 + y^2 + z^2$

D. 1



Q13 Mathematics

In a triangle, if one angle measures twice the smallest angle and the third one measures three times the smallest angle, then the measure of the greatest angle is _____.

A. 45°

B. 30°

C. 90°



D. 120°

Q14 Mathematics

The roots of the quadratic equation $x^2 - 10x + 21 = 0$ are:

A. 7, -3

B. 3, -7

C. -7, -3

D. 7, 3



Q15 Mathematics

Find the number of sides of a regular polygon, each interior angle of which is 90° .

A. 5

B. 8

C. 4



D. 3

Q16 Mathematics

The HCF of 2410 and 2700 is _____.

A. 1

B. 2

C. 5

D. 10



Q17 Mathematics

When the price of a magazine was reduced by 30%, its sale increased by 70%. The net revenue:

- A. increased by 19% ☒
- B. increased by 17%
- C. decreased by 19%
- D. decreased by 20%

Q18 Mathematics

Manjit is 2 years elder to his friend Ranjit. Manjit's father is twice as old as Manjit and Ranjit is twice as old as his sister. The ages of Manjit's father and Ranjit's sister differ by 43 years. The ages of Manjit and Ranjit, respectively, are:

- A. 26 and 24
- B. 28 and 26 ☒
- C. 36 and 34
- D. 38 and 36

Q19 Mathematics

X is twice as good a workman as Y and together they finish a piece of work in 14 days. In how many days will X alone finish the work?

- A. 28 days
- B. 21 days ☒
- C. 20 days
- D. 22 days

Q20 Mathematics

Simplify $\frac{6 + 6 \times 6}{3 \times 3 + 5} \div \frac{\frac{1}{2} \div \frac{1}{2} \text{ of } \frac{1}{2}}{\frac{1}{2} \div \frac{1}{2} \times \frac{1}{2}}$.

- A. 3
- B. $\frac{3}{4}$ ☒
- C. $\frac{4}{3}$
- D. $\frac{1}{3}$



Q21 Mathematics

At what rate per cent per annum will a certain sum of money double itself in 2 years, the interest being compounded annually? [Give your answer correct to 1 decimal place.]

A. 44.4%

B. 41.4% ☒

C. 40.4%

D. 39.4%

Q22 Mathematics

The quadratic equation whose roots are 3 and $\frac{1}{3}$ is:

A. $3x^2 + 10x + 3 = 0$

B. $3x^2 + 10x - 3 = 0$

C. $3x^2 - 10x + 3 = 0$ ☒

D. $3x^2 - 10x - 3 = 0$

Q23 Mathematics

What is the value of k if $\frac{2^{-2k} \times 4^{k+3}}{4^{-k+2}} = 2^{k-2}$

A. 1

B. 2

C. -1

D. -4 ☒

Q24 Mathematics

If $\cos\theta = \frac{x}{\sin\theta}$, then the value of $\sin^6\theta + \cos^6\theta =$ _____.

A. 0

B. 1

C. $3x^2 - 1$

D. $1 - 3x^2$ ☒



What is the mode of the data given below? [Give your answer correct to 2 decimal places.]

Age in years	15-25	25-35	35-45	45-55	55-65	65-75	75-85
No. of patients	12	18	20	25	30	20	15

A. 58.33



B. 55.33

C. 63.33

D. 57.33



Mathematics

25 Questions • Answer Key

Q1 Mathematics

An alloy is made of aluminium and nickel in the ratio 3 : 4. The quantity (in kg) of nickel required to be melted with 36 kg of aluminium is _____.

A. 18

B. 3

C. 48



D. 32

Q2 Mathematics

Farah got married 8 years ago. Today her age is $\frac{9}{7}$ times her age at the time of her marriage. At present her daughter's age is $\frac{1}{6}$ of her age. Her daughter's age 3 years ago was:

A. 3 years



B. 6 years

C. 9 years

D. 12 years

Q3 Mathematics

Find the cost of tiling the verandah, at the rate of ₹ 24 per m^2 , if the length and breadth of the verandah are in the ratio 3 : 1 and its perimeter is 40 m.

A. ₹ 1,700

B. ₹ 1,800



C. ₹ 1,600

D. ₹ 1,900

Q4 Mathematics

Simplify $12 \text{ of } 3 - 24 \text{ of } 4 \div 12$.

A. -5

B. 4

C. 5

D. 28



Q5 Mathematics

m and n are two parallel lines. If l is a transversal intersecting m and n, then the sum of the interior angles formed on the same side of l is equal to:

A. 90°

B. 180°



C. 270°

D. 360°

Q6 Mathematics

25% of a number is 1320. Find 35% of the same number.

A. 1260

B. 1166

C. 1644

D. 1848



Q7 Mathematics

The average of the all natural numbers between 12 and 39 which are divisible by 5 is _____.

A. 25.5

B. 21

C. 25



D. 28

Q8 Mathematics

If $\frac{5^{3n+2}}{5^{4n-1}} = 25$, then $n =$ _____.

A. 5

B. -1

C. 2

D. 1



Q9 Mathematics

Two numbers are in the ratio 11 : 17 and the difference between the numbers is 18. The HCF and the LCM of these numbers, respectively, are:

- A. 9 and 567
- B. 5 and 569
- C. 3 and 561
- D. 7 and 563

**Q10 Mathematics**

A train goes from A to B at a speed of 20 km/h and returns from B to A by the same route at 30 km/h. The average speed (in km/h) of the train during the two-way journey is:

- A. 22
- B. 23
- C. 24
- D. 25

**Q11 Mathematics**

The roots of the quadratic equation $x^2 + 10x + 21 = 0$ are:

- A. 7, -3
- B. 3, -7
- C. -3, -7
- D. 7, 3

**Q12 Mathematics**

The value of $2\sqrt{2}\sin 45^\circ \sin 30^\circ + 2\sqrt{3}\cos 60^\circ \tan 60^\circ - \sin 90^\circ$ is _____.

- A. 0
- B. 1
- C. -1
- D. 3



Q13 Mathematics

The value of $(625)^{-1/2}$ is _____.

A. 25

B. 0.25

C. 0.04



D. 2.5

Q14 Mathematics

If $\frac{196}{0.196} = \frac{19.6}{n}$, then the value of n = _____.

A. 0.196

B. 0.00196

C. 0.0196



D. 1.96

Q15 Mathematics

If the interest on a sum of ₹ y at 4% per annum compounded annually for 2 years is ₹612, then the total amount payable at the end of the two-year period will be _____.

A. ₹8,002

B. ₹8,112



C. ₹8,262

D. ₹7,812

Q16 Mathematics

A and B can do a piece of work in 12 days and 8 days, respectively. The number of days required to complete the work if both A and B work together is:

A. 2.4

B. 3.2

C. 4.8



D. 6.4



Q17 Mathematics

If the lengths of the sides of a triangle are $x + 1$, $7 - x$ and $4x - 2$, then the value of x for which the triangle represents an isosceles triangle is _____.

A. 2.4

B. 1

C. 1.8



D. 3

Q18 Mathematics

The LCM of two numbers is 1260 and their HCF is 30. If one of the two numbers is 180, find the other number.

A. 200

B. 210



C. 240

D. 270

Q19 Mathematics

Find the volume (in cm^3) of a sphere having a diameter of 8 cm, giving your answer correct to two places of decimal.

Take $\pi = \frac{22}{7}$

A. 248.19

B. 258.19

C. 268.19



D. 278.19

Q20 Mathematics

The value of $\sqrt{190 + \sqrt{11 + \sqrt{617 + 8}}}$ is _____.

A. 12

B. 16

C. 13

D. 14



Q21 Mathematics

The roots of $6 - 4x^2 + 5x = 0$ are:

A. $-2, -\frac{3}{4}$

B. $2, \frac{3}{4}$

C. $2, -\frac{3}{4}$ ✓

D. $-2, \frac{3}{4}$

Q22 Mathematics

A train travels at an average speed of 30 miles per hour for $2\frac{1}{2}$ hours and then travels at a speed of 60 miles per hour for $1\frac{1}{2}$ hours. The total distance (in miles) covered by the train is _____.

A. 90

B. 180

C. 165 ✓

D. 135

Q23 Mathematics

ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA, respectively. The quadrilateral PQRS is necessarily a:

A. rectangle

B. Trapezium, but not a parallelogram

C. rhombus

D. parallelogram ✓

Q24 Mathematics

A dishonest vendor claims that he is selling goods at their cost price. But he is weighing 850 grams for 1000 grams. What is his profit percentage (rounded off to 2 decimal places)?

A. 14.65%

B. 15.65%

C. 16.65%

D. 17.65% ✓



Q25 Mathematics

A shopkeeper offered a machine at a discount of 10% after setting its marked price at 10% above the cost price. His loss percentage is _____.

A. 10%

B. 9.8%

C. 7.8%

D. 1%



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A dishonest shopkeeper sells goods at cost price but uses a weight of 940 gm for one kg. His gain percentage (rounded off to two decimal places) is:

A. 5.38%

B. 6.08%

C. 6.38%



D. 4.38%

Q2 Mathematics

Two trains are moving in opposite directions at speeds of 80 km/h and 120 km/h. The length of one train is 300 m. The time taken by them to cross each other is 12 seconds. The length (in m) of the other train, correct to 2 decimal places, is:

A. 333.33

B. 366.67



C. 377.77

D. 388.88

Q3 Mathematics

If $-(2/3)$ is a root of the equation $kx^2 - 13x - 10 = 0$, then the value of k is:

A. 1

B. 2

C. 3



D. 4

Q4 Mathematics

Three numbers are in the ratio 5 : 6 : 8 and their LCM is 1200. The sum of the numbers is:

A. 210

B. 200

C. 190



D. 180



Q5 Mathematics

The marks scored by 10 students are given below.

17, 13, 18, 11, 15, 13, 19, 18, 13, 17

The mode of the data is:

A. 13



B. 17

C. 11

D. 19

Q6 Mathematics

The ratio of the lengths of two corresponding sides of two similar triangles is 3 : 1. The ratio of their corresponding angles is:

A. 1 : 1



B. 2 : 1

C. 3 : 1

D. 1 : 3

Q7 Mathematics

The value of $(\sin 32^\circ \cos 58^\circ + \cos 32^\circ \sin 58^\circ)$ is:

A. 0

B. 1



C. 2

D. 3

Q8 Mathematics

A cylindrical rod has an outer curved surface area of 2800 cm^2 . If the length of the rod is 100 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is:

Take $\pi = \frac{22}{7}$

A. 2.45

B. 3.45

C. 4.45



D. 5.45



Q9 Mathematics

Neeraj and his sister are 12 years and 3 years old, respectively. After how many years will Neeraj's sister be half as old as Neeraj?

A. 3

B. 6

C. 7

D. 9

**Q10 Mathematics**

A, B and C invested ₹ 10,000, ₹12,000, and ₹15,000, respectively, for 5, 6, and 9 months, respectively, in a business. If A's share in the profit is ₹2,500, then the total profit is:

A. ₹12,550

B. ₹12,650

C. ₹12,700

D. ₹12,850

**Q11 Mathematics**

The roots of the equation $\sqrt{3}x^2 - 8x + 5\sqrt{3} = 0$ are:

A. $-\sqrt{3}, \frac{5}{\sqrt{3}}$ B. $\sqrt{3}, \frac{-5}{\sqrt{3}}$ C. $-\sqrt{3}, \frac{-5}{\sqrt{3}}$ D. $\sqrt{3}, \frac{5}{\sqrt{3}}$ **Q12 Mathematics**

A shopkeeper marked the price of an article at 10% higher than its cost price. He then gives two successive discounts of 5% each. What is his loss or profit percentage?

A. 0.725% loss

B. 0.525% loss

C. 0.725% profit

D. 0.525% profit



Q13 Mathematics

The average age of a husband and his wife was 23 years at the beginning of their marriage. After 5 years of marriage, they had a one-year-old child. The average age of the family of three when the child was born was:

- A. 24 years
- B. 23 years
- C. 20 years
- D. 18 years

**Q14** Mathematics

Factorise $49a^2 + 70ab + 25b^2$.

- A. $(7a + 5b)^2$
- B. $(5a + 7b)^2$
- C. $(7a - 5b)^2$
- D. $(5a - 7b)^2$

**Q15** Mathematics

The LCM of 36, 48, 120 and 300 is:

- A. 900
- B. 1200
- C. 1800
- D. 3600

**Q16** Mathematics

The average of 3^2 , 4^2 , 5^2 , 6^2 and 7^2 is _____.

- A. 28
- B. 27
- C. 25
- D. 24



Q17 Mathematics

The volume (in m^3) of a cube, each of whose edges is 9 m, is:

A. 486

B. 527

C. 648

D. 729 ☒**Q18** Mathematics

Simplify $34 - 66 \div 6 + 18 \times 8$.

A. 104

B. 167 ☒

C. 138

D. -600

Q19 Mathematics

Raghav's monthly salary is ₹18,000. Raghav took a loan of ₹30,000 on simple interest for 3 years at the rate of 5% per annum. The amount that he will be paying as simple interest in 3 years is what percentage of his monthly salary?

A. 25% ☒

B. 20%

C. 30%

D. 35%

Q20 Mathematics

Evaluate $0.\overline{696} \times 0.\overline{27}$.

A. $\frac{2083}{10989}$ B. $\frac{2085}{10989}$ C. $\frac{2087}{10989}$ D. $\frac{2088}{10989}$ ☒

Q21 Mathematics

In an isosceles triangle, the vertex angle measures 80° . What is the measure of each of the base angles?

A. 50° and 50°



B. 60° and 40°

C. 60° and 60°

D. 60° and 50°

Q22 Mathematics

Evaluate 999^3 .

A. 997002999



B. 997003999

C. 997004999

D. 997005999

Q23 Mathematics

The value of $\frac{(0.064) + (0.008)}{0.16 + 0.04 - 0.08}$ is _____.

A. 0.05

B. 2.7

C. 0.6



D. 1.4

Q24 Mathematics

If 2, 3, 8 and y are in proportion, find the value of y.

A. 48

B. 24

C. 16

D. 12



Q25 Mathematics

A boy covers 450 m in 2 minutes 30 seconds. How many kilometres will he cover in an hour if he travels at the same speed mentioned above?

A. 13.5

B. 10.8



C. 12.8

D. 9.6



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A boy goes to school at a speed of 3 km/h. He returns at a speed of 5 km/h. He takes a total of 4 hours for both going to school and returning. The distance (in km) between his home and school is:

- A. 7.2
- B. 7.3
- C. 7.4
- D. 7.5



Q2 Mathematics

If $6 : 18 :: 18 : y$, find the value of y .

- A. 108
- B. 36
- C. 54
- D. 72



Q3 Mathematics

Find the circumference (in m) of the largest circle that can be inscribed in a rectangle whose dimensions are given as 12 m and 7 m.

Take $\pi = \frac{22}{7}$

- A. 37
- B. 22
- C. 19
- D. 11



Q4 Mathematics

A man sells two articles for ₹20,000 each. He gets a profit of 15% on one article and loses 15% on the other article. What is his overall profit or loss (to the nearest integer) in this transaction?

- A. ₹921 profit
- B. ₹921 loss
- C. ₹1,021 profit
- D. ₹1,021 loss



Q5 Mathematics

Two pipes can fill a tank in 25 hours and 35 hours, respectively. The time (in hours) required to fill the tank when both pipes are opened simultaneously is:

A. $\frac{175}{12}$



B. $\frac{165}{12}$

C. $\frac{175}{14}$

D. $\frac{165}{14}$

Q6 Mathematics

During the first year, the population of a town increased by 10% and in the second year it diminished by 10%. At the end of the second year its population was 4,73,220. The population at the beginning of the first year was:

A. 4,78,800

B. 4,78,780

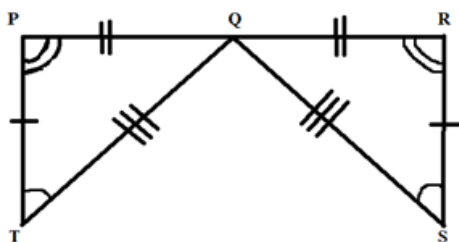
C. 4,78,000



D. 4,78,880

Q7 Mathematics

As per the figure given below, $\Delta QRS \cong$ _____. [Note: Diagram is not drawn to scale or measurements indicated.]



A. ΔQPT



B. ΔPTQ

C. ΔTPQ

D. ΔQTP



Q8 Mathematics

Evaluate $9.4\overline{6} - 2.4\overline{6} + 4.4\overline{6}$.

A. $\frac{10321}{1100}$

B. $\frac{10521}{900}$

C. $\frac{10521}{1100}$

D. $\frac{10321}{900}$ ✓

Q9 Mathematics

Two right-angled triangles are congruent when which of the following conditions is true?

A. When only their hypotenuses are equal

B. When only one of the sides of one of these triangles is equal in length to the corresponding side of the other triangle

C. When their hypotenuses are equal and one of the sides of one of these triangles is equal in length to the corresponding side of the other triangle ✓

D. When one more angle is equal

Q10 Mathematics

There are 50 students (boys and girls only) in a class. The number of boys is 10 more than the number of girls. The number of boys in the class is:

A. 15

B. 20

C. 25

D. 30 ✓

Q11 Mathematics

The HCF of 450, 1500 and 1650 is:

A. 50

B. 100

C. 150 ✓

D. 200



Q12 Mathematics

The quadratic equation $3x^2 - 4\sqrt{3}x + 4 = 0$ has:

- A. two distinct real roots
- B. two equal real roots
- C. no real roots
- D. two imaginary roots



Q13 Mathematics

The area of a square plot is 2916 m^2 . The length of each side of the plot (in m) is

- A. 44
- B. 54
- C. 58
- D. 64



Q14 Mathematics

Write the expanded form of $(3a + 4b + 5c)^2$.

- A. $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 30ac$
- B. $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 40ac$
- C. $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 50ac$
- D. $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 60ac$



Q15 Mathematics

The greatest number which divides 1876, 12503, and 6877 leaving remainders 1, 3, and 2, respectively, is:

- A. 625
- B. 675
- C. 555
- D. 655



Q16 Mathematics

The weights (in kg) of 9 members of a school cricket team are 50, 63, x, 62, 64, 48, 51, 55, 48. If the mean weight is 56 kg, then the value of x is _____.

A. 64

B. 48

C. 63



D. 57

Q17 Mathematics

A bronze article having a marked price of ₹1,000 is sold during a festive season sale after three successive discounts of 20% and 30% and 10%. What will be the amount (in ₹) to be paid by a customer if she buys the article during the festival season?

A. 496

B. 508

C. 504



D. 564

Q18 Mathematics

A cricket club bought 12 bats and 18 balls for ₹2,100. After a few days, the cost of the same types of 8 bats and 22 balls purchased at the same rates was ₹1,900. The cost of a bat is:

A. ₹50

B. ₹100



C. ₹150

D. ₹200

Q19 Mathematics

The positive square root of $\left(\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}} + 11\right)$ is _____.

A. $2\sqrt{3}$ B. $2 + \sqrt{3}$

C. 5

D. $5 - \sqrt{3}$ 

Q20 Mathematics

Find the value of $\frac{\cos^2 12^\circ + \cos^2 23^\circ}{2\sin^2 78^\circ + 2\sin^2 67^\circ}$.

A. 0

B. 1

C. $\frac{1}{2}$ 

D. 2

Q21 Mathematics

If the length of the longest diagonal of a closed cube is $10\sqrt{3}$ cm, then its total surface area (in cm^2) is _____.

A. 300

B. 600



C. 900

D. $100\sqrt{3}$ **Q22** Mathematics

Four years ago, Rajesh was three times as old as Naresh. Four years hence he will be twice as old as Naresh will then be. The present age of Rajesh (in years) is:

A. 28



B. 32

C. 33

D. 35

Q23 Mathematics

How many years will it take for a certain sum to get doubled at the rate of $6\frac{1}{4}\%$ simple interest per annum?

A. 6.25

B. 16



C. 4

D. 8.4



Q24 Mathematics

The arithmetic mean of 2.5, 6.5, 4.5, 16.5, 3.5 and 2.5 is:

A. 6



B. 7.25

C. 8.25

D. 5.75

Q25 Mathematics

The quadratic equation $x^2 + 7x - 60$ has:

A. two equal roots

B. two real and unequal roots



C. no real roots

D. two equal imaginary roots



Mathematics

25 Questions · Answer Key

Q1 Mathematics

If $4 \sin^2 \theta = 1$ and θ is an acute angle, then the value of $\cos^2 \theta + \tan^2 \theta =$ _____.

A. 1

B. $\frac{1}{4}$ C. $\frac{13}{12}$ D. $\frac{5}{13}$

Q2 Mathematics

Which of the following is NOT necessarily a property of a rhombus?

A. All sides are equal.

B. Opposite sides are parallel.

C. Diagonals are perpendicular bisectors.

D. Diagonals are equal.



Q3 Mathematics

The value of $\sqrt{1225} + \sqrt{6.25} + \sqrt{12.25} - 8$ is _____.

A. 0.16

B. 50

C. 0.75

D. 33



Q4 Mathematics

The equation $(x + 1)^2 - 2(x + 1) = 0$ has:

A. two real roots



B. no real roots

C. one real root

D. two equal roots



Q5 Mathematics

Two parallel lines l and m are intersected by a transversal p . The quadrilateral formed by the bisectors of the interior angles thus obtained is necessarily a:

- A. rhombus
- B. square
- C. parallelogram, but not a rectangle
- D. rectangle ✓

Q6 Mathematics

An article whose marked price is ₹ 800 is sold at a profit of 50% when there are successive discounts of 20%, 10%, and 5% offered by the shopkeeper. The selling price (rounded to the nearest rupee) when the article is sold at a profit of 60%, with the same cost price, is:

- A. ₹684
- B. ₹584 ✓
- C. ₹504
- D. ₹604

Q7 Mathematics

The value of $[(0.413) \div (0.00413)] - 74.27 - 25.72$ is _____.

- A. 0
- B. 1
- C. 0.1
- D. 0.01 ✓

Q8 Mathematics

The value of $\left(\frac{y^{b+c}}{y^{2a}}\right)\left(\frac{y^{c+a}}{y^{2b}}\right)\left(\frac{y^{a+b}}{y^{2c}}\right)$ is _____.

- A. $y^{\frac{ab}{c}}$
- B. y^{abc}
- C. 0
- D. 1 ✓



Q9 Mathematics

3 men or 4 women can do a job in 15 days. 3 men work for 9 days and leave. The number of women required to complete the remaining work in 12 days is:

A. 1

B. 2



C. 3

D. 4

Q10 Mathematics

The roots of the equation $2x^2 - 3x - 20 = 0$ are:

A. 4, 5/2

B. -4, 5/2

C. -4, -5/2

D. 4, -5/2



Q11 Mathematics

A man buys a second-hand car for ₹3,30,000 and spends ₹40,000 on its repairs. What should be its selling price if he wants to earn a 15% profit?

A. ₹4,35,500

B. ₹4,27,000

C. ₹4,25,500



D. ₹4,30,000

Q12 Mathematics

The total surface area (in cm^2) of a closed cube, the length of each of whose sides is 8 cm, is _____.

A. 512

B. 256

C. 384



D. 402



Q13 Mathematics

If interest is ₹3,000, the rate of interest is 6% per annum simple interest, and time period is 4 years, then the principal sum is _____.

A. ₹18,000

B. ₹17,500

C. ₹12,500



D. ₹13,500

Q14 Mathematics

If 5, 15, 20, and y are in proportion, then the value of y is:

A. 40

B. 50

C. 60



D. 80

Q15 Mathematics

Simplify $25 - [7 + 7 \text{ of } (33 - 4 \times 23)]$.

A. -395

B. 431



C. -4651

D. -9313

Q16 Mathematics

A, B and C can complete a piece of work in 48, 12 and 24 days, respectively. Working together, they will complete the work in _____ days.

A. $\frac{51}{7}$

B. 7

C. $\frac{48}{7}$



D. $\frac{47}{7}$



Q17 Mathematics

The correct empirical relationship between the mean, the median, and the mode of a set of data is given by:

- A. $\text{Mean} - \text{Mode} = 3 \times (\text{Mean} - \text{Median})$ ✓
- B. $\text{Mean} - \text{Mode} = 4 \times (\text{Mean} - \text{Median})$
- C. $\text{Mean} - \text{Mode} = 2 \times (\text{Mean} - \text{Median})$
- D. $\text{Mean} - \text{Mode} = 1 \times (\text{Mean} - \text{Median})$

Q18 Mathematics

The numbers obtained when 200 is increased by 5% and decreased by 15% are respectively:

- A. 180 and 170
- B. 210 and 170 ✓
- C. 215 and 150
- D. 210 and 175

Q19 Mathematics

At present, the ratio of the ages of Amit and Sumit is 4 : 3. After 6 years, Amit's age will be 50 years. What is the age of Sumit at present?

- A. 37 years
- B. 24 years
- C. 33 years ✓
- D. 44 years

Q20 Mathematics

The present ages of Kamal and Keerthi are in the ratio 3 : 5. After 9 years, the ratio of their ages will become 3 : 4. The present age of Keerthi is _____.

- A. 17 years
- B. 15 years ✓
- C. 19 years
- D. 12 years



Q21 Mathematics

Which of the following numbers is divisible by 11?

A. 8245964

B. 9246864



C. 7247564

D. 9248164

Q22 Mathematics

The base and the corresponding height of a parallelogram are 10 cm and 6 cm, respectively. The area of the parallelogram (in cm^2) is:

A. 30

B. 45

C. 60



D. 75

Q23 Mathematics

The average age of a class of 50 boys is 12.9 years. It increases to 13 years when one new boy joins the class. The age (in years) of the new boy is _____.

A. 15

B. 16

C. 18



D. 19

Q24 Mathematics

The average of the first 35 natural numbers is _____.

A. 17

B. 17.5

C. 18



D. 18.5



Q25 Mathematics

$(6, y)$ is a pair of co-prime numbers where y is a natural number not exceeding 20. How many possible values of y are there?

A. 5

B. 6

C. 7



D. 8



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The area of a rectangle is 225 cm^2 . The length (x) of the rectangle is 4 more than 4 times the breadth (y). The area in terms of a quadratic form (in x) is:

A. $x^2 + 4x - 900 = 0$

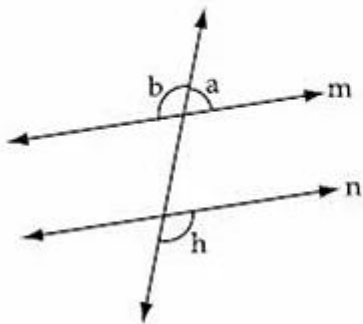
B. $x^2 - 4x + 900 = 0$

C. $x^2 - 4x - 900 = 0$ ✓

D. $x^2 + 4x + 900 = 0$

Q2 Mathematics

In the given figure, if $n \parallel m$ and $m\angle a : m\angle b = 2 : 3$, then what is $m\angle h$?



A. 90°

B. 108° ✓

C. 120°

D. 72°

Q3 Mathematics

The smallest prime number is:

A. 1

B. 2 ✓

C. 3

D. 4



Q4 Mathematics

The positive square root of $(6 + 2\sqrt{3})(6 - 2\sqrt{3})$ is _____.

A. 24

B. 12

C. $6\sqrt{2}$

D. $2\sqrt{6}$ ✓

Q5 Mathematics

The total amount payable after 3 years on a sum of ₹1,000 invested at 10% interest per annum compounded annually is:

A. ₹1,331 ✓

B. ₹1,300

C. ₹1,376

D. ₹1,390

Q6 Mathematics

Ramesh buys a radio for ₹4,000. He sells it at a profit of 10% to Mohan. Mohan spends ₹500 on it. Then he sells it at a profit of 12% to Ritwik. The cost price of the radio to Ritwik is:

A. ₹4,900

B. ₹5,088

C. ₹5,288

D. ₹5,488 ✓

Q7 Mathematics

The perimeter of a circle whose radius is 15 cm is:

A. 50π cm

B. 40π cm

C. 30π cm ✓

D. 20π cm



Q8 Mathematics

If $361 : y :: y : 121$, and $y > 0$, then the value of y is:

A. 381

B. 121

C. 247

D. 209



Q9 Mathematics

Evaluate $984^2 - 16^2$.

A. 967000

B. 968000

C. 969000

D. 966660



Q10 Mathematics

The sum of two numbers is 20 and their difference is 16. The ratio of the larger number to the smaller number is:

A. 11 : 2

B. 2 : 11

C. 9 : 1

D. 1 : 9



Q11 Mathematics

The difference between the compound interest (when interest is compounded annually) and the simple interest if ₹10,000 is deposited at 5% rate of interest per annum for 2 years is:

A. ₹25

B. ₹15

C. ₹35

D. ₹50



Q12 Mathematics

What is the positive difference between the sum of all prime numbers between 11 and 20 (both included) and the sum of all prime numbers between 30 and 50 (both included)?

A. 135

B. 137

C. 139



D. 141

Q13 Mathematics

If the mode of a distribution is 27 and its median is 35, then the mean of the distribution is _____ (using empirical relation).

A. 62

B. 37.5

C. 39



D. 43.5

Q14 Mathematics

At what rate of simple interest per annum will a sum of money get doubled in 10 years?

A. 20%

B. 15%

C. 10%



D. 8.5%

Q15 Mathematics

A and B can do a job in 14 days and 18 days, respectively. A works alone for 6 days and leaves. The number of days required by B to complete the remaining job is:

A. $10\frac{2}{7}$



B. $10\frac{3}{7}$

C. $10\frac{4}{7}$

D. $10\frac{5}{7}$



Q16 Mathematics

A shopkeeper sells wheat at ₹20/kg that he purchased at ₹18/kg and he gives only 900 gm of wheat instead of 1 kg while selling. The actual percentage profit of the shopkeeper is:

A. 24.45%

B. 22.45%

C. 23.45 %



D. 20.45%

Q17 Mathematics

Evaluate $\frac{1}{\frac{4}{5} + \frac{3}{7}} \div \frac{8}{35}$.

A. $3\frac{191}{344}$ B. $3\frac{193}{344}$ C. $3\frac{197}{344}$ D. $3\frac{199}{344}$ **Q18** Mathematics

What is the sum of the measures of the exterior angles of a triangle?

A. 90° B. 180° C. 270° D. 360° **Q19** Mathematics

Which of the following describes the nature of the roots of the quadratic equation $3x^2 - 4x + 10 = 0$?

A. No real roots



B. Two equal roots

C. Two distinct real roots

D. One real root and one imaginary root



Q20 Mathematics

Evaluate 93^2 .

- A. 8349
- B. 8449
- C. 8549
- D. 8649



Q21 Mathematics

The average of 10, 15, 30, 100 is:

- A. 38.75
- B. 39.55
- C. 39.45
- D. 38.65



Q22 Mathematics

If $2\tan \theta = 3$, then the value of $(\sec \theta + \tan \theta - 1)(\sec \theta - \tan \theta + 1) =$ _____.

- A. 2
- B. $\frac{2}{3}$
- C. 3
- D. $\frac{1}{3}$



Q23 Mathematics

A certain amount of money was divided between x and y in the ratio 4 : 3. If y's share is ₹2,400, the total initial amount is _____.

- A. ₹6,000
- B. ₹8,000
- C. ₹5,600
- D. ₹7,200



Q24 Mathematics

The larger of two supplementary angles is 36° more than the smaller. The smaller angle is:

A. 72°



B. 108°

C. 27°

D. 63°

Q25 Mathematics

If we add 1 to the numerator and subtract 1 from the denominator of a given fraction, it becomes 1. It becomes $\frac{2}{3}$ if 1 is added to the denominator of the given fraction while the numerator is left unchanged. The fraction originally given is:

A. $\frac{1}{8}$

B. $\frac{3}{8}$

C. $\frac{5}{8}$

D. $\frac{6}{8}$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Find the value of $3^{-5} \times 4^{-5} \times 5^{-5}$.

A. $\frac{1}{30^5}$

B. $\frac{1}{40^5}$

C. $\frac{1}{50^5}$

D. $\frac{1}{60^5}$ ✓

Q2 Mathematics

If two parallel lines are intersected by a transversal, then the internal bisectors of two pairs of interior angles necessarily enclose a _____.

A. square

B. circle

C. rectangle ✓

D. triangle

Q3 Mathematics

A diver rowing at the speed of 3 km/h in still water takes double the time going 50 km upstream compared to going 50 km downstream. The speed of the stream is:

A. $\frac{4}{3}$ km/h

B. 1 km/h ✓

C. $\frac{7}{3}$ km/h

D. 3 km/h



Q4 Mathematics

16 men can do a piece of work in 5 days. The number of men required to complete the same work in 20 days is:

A. 3

B. 4



C. 5

D. 6

Q5 Mathematics

The cost price of 42 articles is equal to the selling price of 36 articles. What is the gain or loss made in the transaction?

A. $16\frac{2}{3}\%$ loss

B. $14\frac{1}{7}\%$ gain

C. $16\frac{2}{3}\%$ gain



D. $14\frac{1}{7}\%$ loss

Q6 Mathematics

What will be the total amount payable on a sum of ₹12,500 after two years at the rate of 10% per annum if the interest is compounded annually?

A. ₹25,000

B. ₹15,125



C. ₹18,500

D. ₹17,790

Q7 Mathematics

The number of non-square numbers between 87^2 and 88^2 is:

A. 154

B. 164

C. 174



D. 184



Q8 Mathematics

The salary of a person is ₹2,00,000. If he saves an amount of ₹88,000, then the person saves _____ of his salary.

- A. 44.20%
- B. 44.00%
- C. 42.74%
- D. 42.85%



Q9 Mathematics

The sum of all the interior angles of a heptagon is equal to

- A. 540°
- B. 720°
- C. 810°
- D. 900°



Q10 Mathematics

The average weight of 6 persons increases by 2 kg when one of them whose weight is 72 kg is replaced by a new man. The weight of the new man is:

- A. 104 kg
- B. 94 kg
- C. 84 kg
- D. 74 kg



Q11 Mathematics

A's age is seven times B's age. If the sum of their ages is 48 years, then their ages are:

- A. 35 and 5
- B. 46 and 6
- C. 40 and 8
- D. 42 and 6



Q12 Mathematics

If α, β are the roots of the quadratic equation $x^2 - 11x + 18 = 0$, then the value of $\alpha^2 + \beta^2$ is:

A. 105

B. 95

C. 85



D. 75

Q13 Mathematics

Two plates and three spoons cost is ₹86. The cost of four plates and a spoon is ₹112. The difference between the cost of a plate and that of a spoon is _____.

A. ₹26

B. ₹18

C. ₹13



D. ₹16

Q14 Mathematics

Naresh deposited a sum of ₹10,000 at 10% rate of interest per annum, compounded annually. The total amount received by Naresh after 2 years is:

A. ₹12,200

B. ₹12,100



C. ₹12,010

D. ₹12,000

Q15 Mathematics

If $5^{n+2} = 3125$, then $n =$ _____.

A. 5

B. 4

C. 2

D. 3



Q16 Mathematics

The average of the numbers 15, 17, 20, 25, 32 and 35 is:

A. 18

B. 28

C. 24



D. 14

Q17 Mathematics

A vendor sells 10 pens for ₹7. He earns a profit of 40%. The cost price of one pen is:

A. ₹0.60

B. ₹0.56

C. ₹0.45

D. ₹0.50



Q18 Mathematics

The HCF and the LCM of two numbers are 44 and 264, respectively. If one of the numbers is $\frac{3}{2}$ times of the other, what is the smaller number?

A. 44

B. 88



C. 132

D. 176

Q19 Mathematics

The value of $\frac{\sqrt{1296}}{\sqrt{121}} \times \frac{15}{(216)^{1/3}} \times \frac{11}{\sqrt{225}}$ is _____.

A. 11

B. 15

C. 6



D. 36



Q20 Mathematics

If ₹1,368 is divided into two parts in the ratio of 5 : 3, then the amount (in ₹) in the greater part is _____.

A. 268.80

B. 444.72

C. 855.00



D. 585.00

Q21 Mathematics

$\sec^2 \theta + (\operatorname{cosec}^2 \theta - 1) - (1 + \tan^2 \theta) - \cot^2 \theta =$ _____.

A. $\cot^2 \theta$

B. $\sec^2 \theta$

C. 0



D. 1

Q22 Mathematics

The total surface area (in m^2) of a cube, each of whose edges measures 4 m, is:

A. 64

B. 72

C. 96



D. 108

Q23 Mathematics

If the three sides of a triangle are in the ratio 7 : 5 : 4 and its perimeter 48 m, then the area of triangle is:

A. $37\sqrt{6} \text{ m}^2$

B. $39\sqrt{6} \text{ m}^2$

C. $36\sqrt{6} \text{ m}^2$



D. 34 m^2



Q24 Mathematics

Evaluate 95×103 .

A. 9785



B. 9685

C. 9755

D. 9655

Q25 Mathematics

If the sum of the LCM and the HCF of two numbers is 1050 and if their HCF is 630 less than their LCM, then the product of those two numbers is _____.

A. 661500

B. 176400



C. 630000

D. 10500



Mathematics

25 Questions · Answer Key

Q1 Mathematics

Ravi's salary was first reduced by 50% and subsequently raised by 50%. How much lower was his final salary compared to his initial salary?

A. 21%

B. 24%

C. 25%



D. 32%

Q2 Mathematics

The area (in cm^2) of an equilateral triangle of side 3 cm is:

A. $\frac{\sqrt{243}}{4}$ B. $\frac{\sqrt{243}}{2}$ C. $\frac{\sqrt{243}}{6}$ D. $\frac{\sqrt{243}}{3}$

Q3 Mathematics

Find the value of $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$.

A. 25

B. 29



C. 21

D. 13



Q4 Mathematics

The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. The number is:

A. 27

B. 57



C. 67

D. 76

Q5 Mathematics

The volumes of two spheres are in the ratio of 27 : 8. The ratio of the surface areas of these spheres, in the order in which they are mentioned here, is _____.

A. 2 : 3

B. 3 : 2

C. 4 : 9

D. 9 : 4

**Q6 Mathematics**

The ratio of the lengths of two corresponding sides of two similar triangles is 2 : 1. The ratio of the areas of these two triangles, in the order mentioned, is:

A. 2 : 1

B. $2\sqrt{2} : 1$

C. 3 : 1

D. 4 : 1

**Q7 Mathematics**

Five years from now, father's age will be three times the age of his son. Five years ago, father was seven times as old as his son. Their present ages are:

A. 40 and 10



B. 30 and 5

C. 40 and 5

D. 30 and 10



Q8 Mathematics

The value of $\sin x + \frac{\cos x}{\tan(90 - x)}$ is _____.

A. $2\operatorname{cosec}x$

B. $\tan x$

C. $\cot x$

D. $2\sin x$ ✓

Q9 Mathematics

Two trains having lengths of 200 m and 300 m are running at speeds of 100 km/h and 120 km/h, respectively, in the same direction. The time taken (in minutes) by the faster train, coming from behind, to completely cross the other train is:

A. 0.5

B. 1

C. 1.5 ✓

D. 2

Q10 Mathematics

The smallest natural number which is divisible by 8, 12, 28 and 36 is:

A. 168

B. 504 ✓

C. 252

D. 336

Q11 Mathematics

If the volume of a solid right circular cylinder is 198 m^3 and the radius of its base is 3 m, then its height (in m) is _____. Take $\pi = \frac{22}{7}$.

A. 6

B. 27

C. 7 ✓

D. 9



Q12 Mathematics

If $25 - (x^2 - 9) = (81)^{1/2}$, then the positive value of $x =$ _____.

A. 2.5

B. 2

C. 5



D. 4.7

Q13 Mathematics

A farmer planted an identical number of saplings of each of three types of trees in a garden. All saplings of one type were planted in the form of a single rectangle, with no rectangle having saplings of more than one type of tree, and no sapling of any type remaining unplanted. Once planted, there were 70 rows in the rectangle of saplings of Tree A, 28 rows in the rectangle of saplings of Tree B, and 42 rows in the rectangle of saplings of Tree C. Find the minimum number of saplings of each type that was planted in the garden by the farmer.

A. 70

B. 210

C. 420



D. 140

Q14 Mathematics

A vendor claims to sell wheat at a loss of 20%. But he cheats by using weights that weigh 40% less than what is mentioned on them. What is his profit percentage (rounded off to 2 decimal places)?

A. 16.67%

B. 33.33%



C. 34.33%

D. 35.33%

Q15 Mathematics

Find the median from the following data.

Age in years	15-25	25-35	35-45	45-55	55-65	65-75	75-85
No. of patients	12	18	20	25	30	20	15

A. 51

B. 53



C. 55

D. 57



Q16 Mathematics

A shopkeeper purchased 70 kg of onions for ₹560 and sold the whole lot at the rate of ₹10 per kg. What will be his gain percentage?

A. 17.5%

B. 28%

C. 25% ☒

D. 20%

Q17 Mathematics

Find the value of $\left[\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-4} \times \left(\frac{1}{4}\right)^{-3}\right]^{-3}$

A. $\left(\frac{5}{32}\right)^9$ ☒B. $\left(\frac{5}{4}\right)^9$ C. $\left(\frac{32}{5}\right)^9$ D. $\left(\frac{5}{4}\right)^7$ **Q18** Mathematics

Manish deposited a certain sum of money at 5% rate of interest per annum, compounded annually. At the end of 3 years, Manish received a total amount of ₹92,610. What was the sum of money deposited by Manish?

A. ₹82,610

B. ₹80,000 ☒

C. ₹80,530

D. ₹79,460



Q19 Mathematics

Simplify $(4pq + 3q)^2 - (4pq - 3q)^2$.

A. $48p^2q^2$

B. $48pq^2$ ✓

C. $24pq^2$

D. $24p^2q^2$

Q20 Mathematics

A man deposits ₹8,000 at 10% rate of simple interest per annum. The total amount he will get at the end of 2 years is:

A. ₹9,760

B. ₹9,200

C. ₹9,800

D. ₹9,600 ✓

Q21 Mathematics

If 35% of $x = 40\%$ of y , then $x : y$ is _____.

A. 7 : 8

B. 8 : 7 ✓

C. 8 : 9

D. 9 : 8

Q22 Mathematics

Mahesh withdrew ₹2,000 from a bank. He received a total of 32 notes of ₹50 and ₹100 denominations. The number of ₹50 notes received by him was:

A. 8

B. 16

C. 24 ✓

D. 32



Q23 Mathematics

The average weight of 32 parcels was recorded as 96 kg. If the weight of one more parcel is included, the average is increased by 2 kg. The weight of the new parcel is:

A. 192 kg

B. 182 kg

C. 172 kg

D. 162 kg

**Q24** Mathematics

If α, β are the roots of the quadratic equation $2x^2 - 3x - 35 = 0$, then the value of $\alpha^3 + \beta^3$ is:

A. $\frac{957}{8}$ B. $\frac{857}{8}$ C. $\frac{757}{8}$ D. $\frac{657}{8}$ **Q25** Mathematics

Ramu is younger than Sunil by 8 years. If their present ages are in the ratio of 7 : 9, then how old is Ramu?

A. 56 years

B. 72 years

C. 36 years

D. 28 years



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The sum of the squares of two consecutive odd natural numbers is 74. The sum of the numbers is:

- A. 18
- B. 24
- C. 28
- D. 12



Q2 Mathematics

If the radius of a sphere is halved, then the new volume will become _____ the original volume.

- A. $\frac{1}{4}$ times
- B. 8 times
- C. 4 times
- D. $\frac{1}{8}$ times



Q3 Mathematics

If the area of a triangle whose base measures 3 cm is 4 cm^2 , then its corresponding height is:

- A. $2\frac{2}{3} \text{ cm}$
- B. $1\frac{2}{3} \text{ cm}$
- C. $3\frac{2}{3} \text{ cm}$
- D. $4\frac{1}{3} \text{ cm}$



Q4 Mathematics

A person who spends $36\frac{2}{3}\%$ of his monthly income is able to save ₹5,700 per month. His monthly expenses are:

- A. ₹6,300
- B. ₹5,300
- C. ₹4,300
- D. ₹3,300



Q5 Mathematics

If a square has a side of $(5x-8)$ cm, then the area of the square (in cm^2) is:

A. $25x^2 - 80x - 64$

B. $25x^2 - 80x + 64$ ✓

C. $25x^2 + 80x - 64$

D. $25x^2 + 80x + 64$

Q6 Mathematics

The roots of the quadratic equation $x^2 + x - 2 = 0$ are:

A. $(1, 2)$

B. $(-1, 2)$

C. $(1, -2)$ ✓

D. $(-1, -2)$

Q7 Mathematics

Convert $\frac{23}{11}$ to its recurring decimal form.

A. $2.\overline{09}$ ✓

B. $2.\overline{18}$

C. $2.\overline{23}$

D. $2.\overline{32}$

Q8 Mathematics

Which of the following is the standard representation of quadratic equation

$$(x^2 + 1)(x - 1) = (x^2 - 3)(x + 3)?$$

A. $4x^2 - x - 6 = 0$

B. $4x^2 - 8 = 0$

C. $x^2 - 3x - 4 = 0$

D. $4x^2 - 4x - 8 = 0$ ✓



Q9 Mathematics

If $\left(\frac{25}{9}\right)^{x+1} \left(\frac{81}{625}\right)^{x-1} = \frac{9}{25}$, then find the value of x .

A. 5

B. 4

C. 6

D. 8



Q10 Mathematics

$\frac{\cos 45^\circ}{\sec 30^\circ + \operatorname{cosec} 30^\circ}$ is equal to:

A. $\frac{\sqrt{3}}{2\sqrt{3}(1 + \sqrt{2})}$

B. $\frac{\sqrt{2}}{2\sqrt{2}(1 + \sqrt{3})}$

C. $\frac{\sqrt{3}}{\sqrt{2}(1 + \sqrt{3})}$

D. $\frac{\sqrt{3}}{2\sqrt{2}(1 + \sqrt{3})}$



Q11 Mathematics

Which of the following is always true?

a) The bisectors of angles of a parallelogram form a rectangle.

b) A parallelogram is a trapezium.

c) Diagonals of a rhombus are equal and bisect each other at right angles.

A. Only (a)

B. Only (b)

C. Only (a) and (b)

D. All of (a), (b), (c)

Dropped by RRB: discrepancy found in question/answer, ignored for all candidates (no answer key).



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Q12 Mathematics

A sum of money was invested at a certain rate of simple interest per annum for a period of 4 years. Had the rate of simple interest per annum been 2% more, the sum invested would have earned a total of ₹640 more as interest in these 4 years. What was the sum (in ₹) invested?

A. 7,500

B. 8,000



C. 9,000

D. 9,500

Q13 Mathematics

The sum of the digits of a two-digit number is 15. The number obtained by interchanging the digits exceeds the given number by 9. The number is:

A. 78



B. 57

C. 98

D. 27

Q14 Mathematics

The highest common factor of a set of coprime numbers is equal to:

A. 1



B. 2

C. the lowest among them

D. the highest among them

Q15 Mathematics

The distance between two points on a map is 5 cm. The scale of the map is 1 : 400000. The actual distance between the two points (in km) is:

A. 20



B. 200

C. 2000

D. 20000



Q16 Mathematics

The value of $(6 - 3) \div [(9 - 6) \div \{ (6 - 4) \div (2 + \frac{8}{13}) \}]$ is:

A. $\frac{5}{17}$

B. $\frac{1}{17}$

C. $\frac{13}{17}$ ✓

D. $\frac{26}{17}$

Q17 Mathematics

The LCM of two numbers is 588. Which of the following CANNOT be their HCF?

A. 21

B. 28

C. 35 ✓

D. 49

Q18 Mathematics

Study the given table and answer the question that follows.

The marks obtained in Mathematics by 41 students of Class X are given in the table.

Number of marks	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students	8	7	6	11	9

What is the arithmetic mean of the marks obtained by these students? [Give your answer correct to 3 decimal places.]

A. 38.675

B. 36.463 ✓

C. 36.745

D. 35.225



Q19 Mathematics

If a man was to sell an article for ₹ 840, he would lose 20%. To gain 25% he should sell it for ____.

A. ₹1,200.50

B. ₹1,212.50

C. ₹1,300.50

D. ₹1,312.50



Q20 Mathematics

If $14 : y :: 7 : 8$, find the value of y.

A. 56

B. 16

C. 28

D. 18



Q21 Mathematics

If two pipes A and B function simultaneously, an empty tank will be filled in 20 hours. If pipe A, working alone, fills this empty tank 9 hours faster than pipe B can fill it working alone, then how many hours does it take pipe B to fill this empty tank while working alone?

A. 36 hours

B. 45 hours

C. 42 hours

D. 39 hours



Q22 Mathematics

If the mean of a distribution is 8.73 and its median is 11, then the mode of the distribution is _____ (using empirical relation).

A. 19.73

B. 22

C. 17.46

D. 15.54



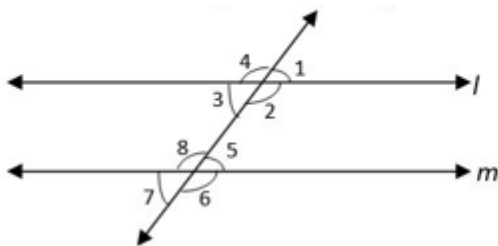
Q23 Mathematics

A two-digit number z is exactly six times the sum of its digits and the difference of the number formed by reversing the digits of z from the original number z is 9. Then z is:

- A. 45
- B. 36
- C. 42
- D. 54

**Q24** Mathematics

In the given figure, if $l \parallel m$, then which of the following relations is not necessarily true?



- A. $\angle 2 = \angle 5$
- B. $\angle 1 = \angle 7$
- C. $\angle 8 = \angle 6$
- D. $\angle 1 = \angle 5$

**Q25** Mathematics

A shopkeeper marks the price of an article 10% more than the cost price. After allowing discount, he earns 5% profit. The discount percentage is:

- A. 4.54%
- B. 5.54%
- C. 3%
- D. 4%



Mathematics

25 Questions • Answer Key

Q1 Mathematics

If $x - \frac{1}{x} = 5$, then the value of $x^4 + \frac{1}{x^4}$ is:

A. 927

B. 827

C. 727



D. 627

Q2 Mathematics

If $16 : y :: y : 25$, find the positive value of y .

A. 10

B. 15

C. 18

D. 20



Q3 Mathematics

If $5^{x+y} = 125$ and $5^{x-y} = 3125$, then the value of y is:

A. -1



B. -2

C. -4

D. -3

Q4 Mathematics

What is the quadratic equation whose roots are 2 and $-\frac{1}{2}$?

A. $2x^2 - 3x - 1 = 0$ B. $2x^2 - 3x - 2 = 0$ C. $2x^2 - 3x - 3 = 0$ D. $2x^2 - 3x - 4 = 0$ 

Q5 Mathematics

In a triangle PQR, $\angle P = 30^\circ$ and the straight line UV is drawn parallel to QR, intersecting PQ at S and PR at T. Which of the following is always true?

- a) $\frac{PS}{PQ} = \frac{PT}{PR}$
- b) $ST = \frac{QR}{2}$
- c) The triangle PST is similar to the triangle PQR.

- A. Only (a)
- B. All of (a), (b) and (c)
- C. Only (a) and (b)
- D. Only (a) and (c) ✓

Q6 Mathematics

The ratio of $9^{3.5} : 3^5$ is the same as:

- A. 7 : 1
- B. 1 : 7
- C. 1 : 14
- D. 9 : 1 ✓

Q7 Mathematics

The ages of Ram and Sita are in the ratio 5 : 8. Three years later the sum of their ages will be 58 years. The present age of Ram is:

- A. 22 years
- B. 21 years
- C. 20 years ✓
- D. 25 years

Q8 Mathematics

At present, a man is 50 years old and his daughter is 22 years old. The man will be twice as old as his daughter after _____ years.

- A. 18
- B. 9
- C. 6 ✓
- D. 5



Q9 Mathematics

If the curved surface area of a right circular cylinder is 880 cm^2 and the diameter of its base is 7 cm, then the height (in cm) of the cylinder is _____.

Take $\pi = \frac{22}{7}$.

A. 14

B. 28

C. 40



D. 20

Q10 Mathematics

The smallest 1-digit number to be added to the 6-digit number 234492 so that it is completely divisible by 11 is:

A. 4

B. 5

C. 6



D. 7

Q11 Mathematics

A wholesaler sells a tin of oil at ₹540 and bears a loss of 10%. Now, if he decides to sell another tin of oil with same cost at ₹696, his profit percentage in the sale of second tin will be equal to:

A. 12%

B. 18%

C. 15%

D. 16%



Q12 Mathematics

Ashish sold a cow to Bipin for ₹5,000 by losing 20%. Bipin sold it to Kasim at that price which would have given Ashish a profit of 15%. What is Bipin's gain in this transaction?

A. ₹2,100.00

B. ₹937.50

C. ₹2,187.50



D. ₹1,250.00



Q13 Mathematics

The mode of 5, 18, 6, 7, 6, 2, 3, 4, 24, 2, 7, 21, 2, 81 is:

A. 6

B. 2

C. 7

D. 81

Q14 Mathematics

AD is the altitude of an isosceles triangle ABC in which $AB = AC$. Which of the following is true for AD?

A. AD bisects $\angle A$

B. AD bisects $\angle B$

C. AD bisects $\angle C$

D. AD does not bisect $\angle A$

Q15 Mathematics

If the volume of a solid cube is 216 cm^3 , then its total surface area (in cm^2) is _____.

A. 36

B. 6

C. 216

D. 38

Q16 Mathematics

A number is increased by 30% and then decreased by 40%. The net increase or decrease percentage is:

A. 44% decrease

B. 32% increase

C. 22% decrease

D. 34% increase



Q17 Mathematics

The speed of a bus increases by 4 km/h after every two hours. If the bus covers a distance of 80 km in the first two hours, then the total distance covered by the bus in 10 hours will be:

- A. 440 km
- B. 460 km
- C. 470 km
- D. 480 km

**Q18** Mathematics

The value of $20 - [12 - \{14 - (12 - \overline{16 - 10})\}]$ is:

- A. 8
- B. 20
- C. 16
- D. 10

**Q19** Mathematics

The discriminant of a quadratic equation is 0. The quadratic equation has:

- A. two distinct real roots
- B. two equal real roots
- C. no real roots
- D. three distinct real roots

**Q20** Mathematics

The value of $\sqrt{1 + \left(\frac{1 - \tan A}{1 - \cot A}\right)^2}$ is:

- A. $\cos A$
- B. $\cot A$
- C. $\tan A$
- D. $\sec A$



Q21 Mathematics

The value of x in the proportion equation $5 : 12 :: 9 : x$ is:

A. 21.6



B. 20.6

C. 21.4

D. 20.4

Q22 Mathematics

The sum of the present ages of Ram, Nikhil and Aswin is 111 years. Ten years ago, the ratio of their ages was $2 : 3 : 4$. What is the present age (in years) of Nikhil?

A. 16

B. 28

C. 37



D. 44

Q23 Mathematics

Express $0.5\overline{323}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{5323}{9990}$

B. $\frac{5333}{9990}$

C. $\frac{2659}{4995}$



D. $\frac{2661}{4990}$

Q24 Mathematics

An amount of ₹1,344 is divided among three persons in the ratio of $3 : 4 : 5$. The difference between the largest and the smallest shares in the distribution is:

A. ₹224



B. ₹236

C. ₹248

D. ₹260



Q25 Mathematics

Find the smallest natural number that can be divided by the first five 2-digit positive even numbers without leaving a remainder.

A. 5040



B. 5120

C. 5340

D. 5560



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Express $0.\overline{64}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{9}{11}$

B. $\frac{64}{99}$ ✓

C. $\frac{67}{95}$

D. $\frac{7}{9}$

Q2 Mathematics

A man receives ₹6,500 per month as salary. He saves 20% of his salary every month. His expenditure per month is:

A. ₹4,900

B. ₹5,000

C. ₹5,100

D. ₹5,200 ✓

Q3 Mathematics

Ten years ago, Krishna was one-third as old as he will be 20 years from now. Krishna's present age (in years) is _____.

A. 30

B. 25 ✓

C. 45

D. 27

Q4 Mathematics

The value of the discriminant of the quadratic equation $2x^2 - 4x - 3 = 0$ is:

A. 40 ✓

B. 16

C. 24

D. 36



Q5 Mathematics

Find the value of $[(12 \times 4) \times \{6 \div 4 \times (\frac{7-4}{6})\}]$.

A. 24

B. 36



C. 42

D. 48

Q6 Mathematics

Given that c is the third proportional of 15 and b . If b is the sum of first three odd natural numbers, then the value of c is:

A. $\frac{29}{5}$

B. $\frac{28}{5}$

C. $\frac{27}{5}$



D. $\frac{26}{5}$

Q7 Mathematics

A factory built in the shape of a cuboid except for its roof had its dimensions given as $140 \text{ m} \times 10 \text{ m} \times 10 \text{ m}$. The structure is then closed on the top with a semi-cylindrical structure to exactly cover the open top of the cuboidal structure. The volume (in m^3) of the semi-cylindrical structure forming the roof is:

Take $\pi = \frac{22}{7}$

A. 6500

B. 5500



C. 11000

D. 13000



Q8 Mathematics

Which of the following fractions is the largest?

$$\frac{5}{7}, \frac{9}{14}, \frac{16}{21}, \frac{29}{42}$$

A. $\frac{5}{7}$

B. $\frac{9}{14}$

C. $\frac{16}{21}$



D. $\frac{29}{42}$

Q9 Mathematics

The present total age of A and B is 12 years more than the present total age of B and C. By how many years is C younger than A?

A. 6

B. 8

C. 10

D. 12



Q10 Mathematics

By selling a computer for ₹30,875, a shopkeeper suffers a loss of 5%. At what price should he sell it to gain 7%?

A. ₹35,525

B. ₹34,775



C. ₹36,105

D. ₹33,985



Q11 Mathematics

The traffic signals at three different road crossings change after every 45 seconds, 75 seconds and 90 seconds respectively. If they all change simultaneously at 9:30:00 a.m., then at what time will they next change again simultaneously?

- A. 9:39:20 a.m.
- B. 9:38:00 a.m.
- C. 9:37:30 a.m. ✓
- D. 9:39:10 a.m.

Q12 Mathematics

Two pipes A and B can fill a cistern in 21 minutes and 28 minutes, respectively. Both the pipes are opened together but after 4 minutes, pipe B is turned off. What is the total time taken to fill the tank?

- A. 12 minutes
- B. 13 minutes
- C. 18 minutes ✓
- D. 15 minutes

Q13 Mathematics

The mean of a data is 38 and its median is 46. The mode (using empirical relation) of the data is:

- A. 62 ✓
- B. 63
- C. 64
- D. 65

Q14 Mathematics

The surface area (in cm^2) of a sphere of radius 14 cm is:

Take $\pi = \frac{22}{7}$

- A. 2464 ✓
- B. 1848
- C. 1232
- D. 616



Q15 Mathematics

A company earns a profit that is distributed among the company's three partners in the ratio of 1 : 3 : 5. If the difference between the smallest and the largest shares is ₹80,000, the total profit of the company is:

A. ₹1,80,000



B. ₹1,60,000

C. ₹1,40,000

D. ₹1,20,000

Q16 Mathematics

The difference between the smallest and the largest fractions among $\frac{5}{6}$, $\frac{7}{8}$, $\frac{11}{12}$, $\frac{13}{16}$ is:

A. $\frac{5}{41}$

B. $\frac{5}{43}$

C. $\frac{5}{47}$

D. $\frac{5}{48}$

**Q17** Mathematics

The perimeter of an isosceles triangle is 32 cm. If each of the equal sides is 4 cm longer than the base, then the length of the sides of the triangle are _____.

A. 16, 12, 12

B. 8, 12, 12



C. 14, 10, 10

D. 14, 14, 4

Q18 Mathematics

The perimeter of a square is 32 m. Its area (in m^2) is:

A. 32

B. 56

C. 64



D. 128



Q19 Mathematics

If the cost of two tables and three wooden benches is ₹3,500 and the cost of three tables and two wooden benches is ₹4,000, then the cost (in ₹) of one table is _____.

- A. 500
- B. 2,200
- C. 1,400
- D. 1,000

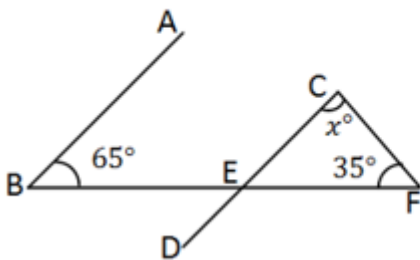
**Q20** Mathematics

A dealer sold his goods at a discount of 20% but set the marked price of each article at 30% above the cost price. His gain percentage on each article is _____.

- A. 5%
- B. 8%
- C. 4%
- D. 10%

**Q21** Mathematics

In the given figure, AB is parallel to CD. What is the value of x° ?



- A. 30°
- B. 100°
- C. 110°
- D. 80°



Q22 Mathematics

Convert $\frac{7893}{9990}$ to its recurring decimal form.

A. $0.\overline{790}$

B. $0.7\overline{900}$ ✓

C. $0.\overline{799}$

D. $0.7\overline{990}$

Q23 Mathematics

A shopkeeper claims to sell his goods at cost price but uses a weight that actually weighs 900 gm though 1 kg is written on it. The gain percentage is:

A. $22\frac{1}{2}\%$

B. $14\frac{1}{3}\%$

C. $11\frac{1}{9}\%$ ✓

D. 9%

Q24 Mathematics

Which of the following numbers is exactly divisible by 18?

A. 239076 ✓

B. 317468

C. 842104

D. 792462

Q25 Mathematics

If α, β be the roots of the quadratic equation $3x^2 - 9x + 8 = 0$, then the value of $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right) + 4\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$ is:

A. 6.125

B. 5.875 ✓

C. 7.225

D. 4.825



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The population of a town in 1980 was 2,25,000. If its population increased in two successive decades by 10% in each decade, the population of the town in 2000 was:

A. 2,72,150

B. 2,72,250



C. 2,72,350

D. 2,72,450

Q2 Mathematics

Using the fact that $4515 \div 12.9 = 350$, find the value of $4.515 \div 12.9$?

A. 35

B. 3.5

C. 0.35



D. 0.035

Q3 Mathematics

The marked price of an article is ₹150. The shopkeeper offers a discount of 20% on the purchase of the article. Thereby, he makes a profit of 25%. The cost price of the article is:

A. ₹72

B. ₹96



C. ₹120

D. ₹144

Q4 Mathematics

The nature of the roots of the quadratic equation $(x + 12)(x + 6) = 4^2$ satisfy the following:

A. both the roots are positive and rational

B. one of the roots is positive and the other one is negative, and both are rational

C. both the roots are negative and rational



D. both the roots are irrational



Q5 Mathematics

The sum of the digits of a 2-digit number is 9. The number at the tens' place is double of the number at the units' place. The 2-digit number is:

A. 63



B. 36

C. 45

D. 54

Q6 Mathematics

Find the value of $[(12 \div 4) \times \{\frac{12}{3} + \frac{5}{3} \times (7 - 4)\}]$.

A. 54

B. 45

C. 36

D. 27

**Q7 Mathematics**

A man makes a monthly payment equal to 15% of his monthly salary towards debt repayment. He spends 75% of the remaining salary and saves ₹425. His monthly salary is:

A. ₹1,800

B. ₹2,000



C. ₹2,200

D. ₹2,400

Q8 Mathematics

₹ 2,000 is divided among A, B and C such that half of A's part, one-third of B's part and one-fifth of C's part are equal. What is A's part (in ₹)?

A. 200

B. 1,000

C. 400



D. 600



Q9 Mathematics

If the diameter of a sphere is 12 cm, then find the volume of the sphere. [Use $\pi = \frac{22}{7}$]

A. $905\frac{1}{7} \text{ cm}^3$



B. $906\frac{6}{7} \text{ cm}^3$

C. $907\frac{4}{7} \text{ cm}^3$

D. $908\frac{2}{7} \text{ cm}^3$

Q10 Mathematics

The value of $[(k^a)^{b-c} \times (k^b)^{c-a} \times (k^c)^{a-b}] \times (x^0 - 1)$ is

A. 1

B. abc

C. $a + b + c$

D. 0



Q11 Mathematics

The roots of the quadratic equation $x + \frac{10}{x} = 7$ are:

A. 2, -5

B.

C. -2, 5

D. 5, 2



Q12 Mathematics

Three numbers are co-prime to one another and the product of the first two and the last two are 432 and 945, respectively. Find the LCM of the three numbers.

A. 16650

B. 14850

C. 15030

D. 15120



Q13 Mathematics

The sum of the ages of William and Brijesh is 20 years. Four years ago, Brijesh's age was half of William's then age. How old (in years) is William at present?

A. 12



B. 10

C. 8

D. 6

Q14 Mathematics

A man spends 20% of his monthly salary on the rent of his house. If every month he also spends ₹600 on his conveyance and ₹3,500 on his grocery and saves the remaining ₹500, his monthly salary is:

A. ₹5,000

B. ₹5,250

C. ₹5,500

D. ₹5,750

**Q15** Mathematics

Evaluate $23^3 + (-11)^3 + (-12)^3$.

A. 9108



B. 8908

C. 8708

D. 8608

Q16 Mathematics

A and B can complete a work in 10 days and 15 days, respectively. They started working together but after 3 days B had to leave and A alone completed the remaining work. In how many days in all was the entire work completed?

A. 8 days



B. 6 days

C. 7 days

D. 5 days



Q17 Mathematics

The mean marks of the following distribution is:

Marks obtained	No. of students
25	5
30	6
35	3
40	1

A. 29

B. 30



C. 31

D. 32

Q18 Mathematics

1000 identical small spheres are cast from a sphere of radius 10 cm, with the total volume of the small spheres being equal to the volume of the larger sphere. The diameter (in cm) of each of the small spheres is:

A. 0.5

B. 1

C. 2



D. 3

Q19 Mathematics

The length of a rectangular park is 22 m more than its breadth. Its area is 1400 m^2 . Its breadth (in m) is:

A. 21

B. 28



C. 35

D. 42

Q20 Mathematics

A trader offers a discount of 10% on an article if a customer makes the payment in cash. How much percentage above the cost price should he mark the article to make a profit of 10%? [Give your answer correct to 2 decimal places.]

A. 11.22%

B. 15.22%

C. 20.22%

D. 22.22%



Q21 Mathematics

Simplify the given expression.

$$\frac{0.068 \times 3.5 \times 12}{3.6 \times 0.17 \times 7}$$

A. $\frac{2}{3}$



B. $\frac{4}{7}$

C. $\frac{1}{4}$

D. $\frac{3}{8}$

Q22 Mathematics

Five years hence the age of Ramesh will be three times the then age of his son, and 5 years ago his age was seven times the then age of his son. Ramesh's present age (in years) is:

A. 38

B. 40



C. 42

D. 44

Q23 Mathematics

Which of the following is NOT NECESSARILY true for congruent triangles?

A. If the three sides of one triangle are equal to the corresponding three sides of another triangle, then the two triangles are congruent.

B. If any two sides and the angle included between the sides of one triangle are equal to the corresponding two sides and the angle included between those two sides of the second triangle, then the two triangles are congruent.

C. If two angles and the included side of one triangle are equal to two angles and the included side of another triangle, then the two triangles are congruent.

D. If two sides and an angle of one triangle are equal to two sides and an angle of the other triangle, then the two triangles are congruent.



Q24 Mathematics

A bus is moving at a speed of 84 km/h. If its speed is reduced by 12%, the new speed of the bus (in km/h) will be:

A. 70.92

B. 71.92

C. 72.92

D. 73.92

**Q25** Mathematics

The value of $3 + 3 \times [(11 - 2) \div 3] - 2 \times 3$ is:

A. 9

B. 8

C. 7

D. 6



Mathematics

25 Questions • Answer Key

Q1 Mathematics

In triangle DEF, side EF is produced to G. If $\angle DFG = 110^\circ$ and $EF = DF$, then $\angle DEF$ measures:

A. 70° B. 55° ✓C. 45° D. 40°

Q2 Mathematics

Using the fact that $\sqrt{18496} = 136$, find the value of $\sqrt{184.96} - \sqrt{1.8496}$.

A. 18.49

B. 14.96

C. 12.24 ✓

D. 10

Q3 Mathematics

The area of a square field is 169 m^2 . Its perimeter (in m) is:

A. 13

B. 26

C. 39

D. 52 ✓

Q4 Mathematics

Mahesh earned ₹1,23,450, ₹1,34,900, ₹98,640, ₹1,26,500, and ₹1,42,000 as his monthly salaries (inclusive of incentives) during the first five months of a year. What is the mean salary (inclusive of incentives) earned every month by Mahesh during the first five months of the given year?

A. ₹1,25,346

B. ₹1,25,098 ✓

C. ₹1,24,975

D. ₹1,24,678



Q5 Mathematics

The decimal equivalent of 50% of 50% is _____.

A. 25

B. 50

C. 0.25



D. 0.50

Q6 Mathematics

Out of 162 students in a school, 72 are boys and the remaining are girls. What is the ratio of the number of girls to the number of boys in that school?

A. 5 : 4



B. 4 : 5

C. 6 : 5

D. 5 : 6

Q7 Mathematics

A taxi charges a fixed charge of ₹40 and an additional charge per kilometre. A person pays ₹150 for 11 km of distance travelled. Find out the charges paid by Ramesh if he travelled for a distance of 20 km.

A. ₹230

B. ₹240



C. ₹250

D. ₹260

Q8 Mathematics

Evaluate

$$(40.25 \div 5) + (0.07 \times 5)$$

$$(0.15 \times 8) + (0.18 \div 0.2)$$

A. 7.5

B. 3

C. 4



D. 5



Q9 Mathematics

Find the smallest natural number which must be subtracted from 2430 to get a perfect square.

A. 25

B. 26

C. 29



D. 36

Q10 Mathematics

Balaram sells a Bluetooth device to Krishna at a profit of 12%. Krishna sells it to Arjun at a profit of 10%. If Arjun pays ₹1,540 for it, what is the cost price of the Bluetooth device for Krishna?

A. ₹1,400



B. ₹1,320

C. ₹1,250

D. ₹1,370

Q11 Mathematics

What digit should come in the place of 'x' so that the given 6-digit number: $28x232$ is exactly divisible by 88?

A. 3

B. 5

C. 7



D. 9

Q12 Mathematics

The present cost of a building is ₹1,28,000. After a year, its cost increased to ₹1,46,000. The percentage increase (rounded off to the nearest integer) in the cost of the building is:

A. 12

B. 13

C. 14



D. 15



Q13 Mathematics

The cost price of an article is ₹1,200. The vendor wants to earn a profit of 15% after giving a discount of 10%. What is the marked price of the article? [Give your answer correct to the nearest integer.]

A. ₹1,433

B. ₹1,466

C. ₹1,566

D. ₹1,533 ☒**Q14** Mathematics

If $\frac{c}{d} + \frac{d}{c} = 1$, then the value of $\frac{c^3 - d^3}{dc^2 - cd^2}$ is:

A. -1

B. 1

C. 0

D. 2 ☒**Q15** Mathematics

A closed metallic cylindrical container is 1.05 m high and its base radius is 35 cm. If the metal sheet costs ₹150 per m^2 , then find the cost of the material used in this container. [Use $\pi = \frac{22}{7}$]

A. ₹462 ☒

B. ₹514

C. ₹360

D. ₹336

Q16 Mathematics

The quadratic equation whose roots are $\frac{1}{\sqrt{2}}$ and $\frac{1}{\sqrt{2}}$ is:

A. $2x^2 - 3\sqrt{2}x + 2 = 0$ B. $2x^2 - 2\sqrt{2}x + 2 = 0$ C. $2x^2 - 3\sqrt{2}x + 1 = 0$ D. $2x^2 - 2\sqrt{2}x + 1 = 0$ ☒

Q17 Mathematics

Krishan is four times as old as Ram. He is also 6 years older than Ram. Krishan's present age (in years) is:

A. 7

B. 8



C. 9

D. 10

Q18 Mathematics

Geetha spends 70% of her monthly income. If her monthly savings is ₹15,600, then her monthly income is:

A. ₹52,000



B. ₹54,000

C. ₹45,000

D. ₹60,000

Q19 Mathematics

A number when decreased by $37\frac{1}{2}\%$, gives 375. The number is:

A. 800

B. 700

C. 600



D. 500

Q20 Mathematics

The cost of 2 pencils and 3 erasers is ₹7 and the cost of 5 pencils and 6 erasers is ₹16. The combined cost of one pencil and one eraser is:

A. ₹1

B. ₹2

C. ₹3



D. ₹4



Q21 Mathematics

The sum of the roots of $x^2 - px + q = 0$ is _____.

A. $\frac{1}{p}$

B. $-p$

C. q

D. p ✓

Q22 Mathematics

Ravi can complete a certain job in 48 days. Kiran is 60% more efficient than Ravi. In how many days will they together complete the same job?

A. $19\frac{5}{13}$ days

B. $20\frac{8}{13}$ days

C. $18\frac{6}{13}$ days ✓

D. $21\frac{7}{13}$ days

Q23 Mathematics

Find the value of $[66 \div \{12 + 5 \times (6 - 4)\}]$.

A. 1

B. 2

C. 3 ✓

D. 4

Q24 Mathematics

From a book containing 264 pages, the teacher taught $\frac{2}{3}$ of the total number of pages and the children studied $\frac{1}{8}$ of the remaining pages at home. How many pages were yet to be either taught by the teacher or studied on their own by the students?

A. 55

B. 77 ✓

C. 80

D. 88



The roots of the quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$ are:

A. $\sqrt{\frac{2}{3}}, \sqrt{\frac{2}{3}}$



B. $\sqrt{\frac{5}{3}}, \sqrt{\frac{2}{3}}$

C. $\sqrt{\frac{1}{3}}, \sqrt{\frac{1}{3}}$

D. $\sqrt{\frac{5}{3}}, \sqrt{\frac{5}{3}}$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Five years hence, the age of Jacob will be four times that of his son. Three years ago, Jacob's age was seven times that of his son. Their present ages are:

- A. 49 and 21
- B. 59 and 21
- C. 59 and 11
- D. 69 and 11



Q2 Mathematics

The greatest number, which divides 2000 and 2200 to leave 22 and 38 respectively as remainders, is:

- A. 36
- B. 39
- C. 42
- D. 46



Q3 Mathematics

The value of $4^2 - 3(8)^{2/3} + (16/9)^{1/2}$ is:

- A. 0
- B. 1
- C. $3\frac{1}{3}$
- D. $5\frac{1}{3}$



Q4 Mathematics

The median of the data using an empirical formula, when it is given that mode = 37.4 and mean = 30.5 is:

- A. 32.8
- B. 31.7
- C. 33.4
- D. 30.5



Q5 Mathematics

The diagonals of a rhombus are 12 cm and 8 cm, respectively. The area of the rhombus (in cm^2) is:

A. 24

B. 48



C. 72

D. 96

Q6 Mathematics

The value of 60% of 28% of 250 = _____.

A. 68

B. 56

C. 42



D. 22

Q7 Mathematics

A sum of ₹7,500 gives a simple interest of ₹1,800 in 4 years. What is the rate of interest per annum?

A. 6%



B. 5%

C. 4%

D. 3%

Q8 Mathematics

Ritesh is 12 years older than the Mohit. 17 years ago, Ritesh's age was four times of Mohit's age. Mohit's present age (in years) is:

A. 18

B. 21



C. 24

D. 27



Q9 Mathematics

Ramesh invested a certain sum of money at 9% per annum simple interest. If he receives an interest of ₹20,250 after one year, the sum he invested is:

A. ₹2,00,000

B. ₹2,25,000



C. ₹2,50,000

D. ₹2,75,000

Q10 Mathematics

Find the value of $[(12 \div \frac{4}{3}) \times \{6 \div 4 \times (\frac{12-7}{6})\} \div \{4 \times 6 \div 3\}]$.

A. $1\frac{13}{32}$



B. $1\frac{15}{32}$

C. $1\frac{11}{32}$

D. $1\frac{17}{32}$

Q11 Mathematics

The average age of 40 students of a class is 15 years. If the age of the teacher is also included, the average age of the whole group becomes 16 years. The age (in years) of the teacher is:

A. 56



B. 54

C. 52

D. 50

Q12 Mathematics

The product of two consecutive positive natural numbers is 72. The greater of the two numbers is:

A. 24

B. 12

C. 9



D. 8



Q13 Mathematics

If a milkman adds 4 ℓ of water to 9 ℓ of milk, then the amount of water he should add to 36 ℓ of milk in order to maintain the same proportion of milk and water will be:

A. 16 ℓ



B. 14 ℓ

C. 12 ℓ

D. 10 ℓ

Q14 Mathematics

The HCF of 64, 48 and y is 8. Which of the options below cannot be a possible value of y ?

A. 72

B. 88

C. 96



D. 104

Q15 Mathematics

The cost of 10 chairs is equal to that of 4 tables. The cost of 15 chairs and 2 tables is equal to ₹2,000. The cost of a table is:

A. ₹500

B. ₹250



C. ₹200

D. ₹100

Q16 Mathematics

The difference between the ages of Radha and Murari is 12 years. Five years ago, the sum of their ages was 28 years. If Radha is older than Murari, find Murari's present age (in years).

A. 13



B. 15

C. 17

D. 25



Q17 Mathematics

The marked price of an article is ₹400 and successive discounts of 10% and 12% are offered on its sale. The selling price of the article is:

A. ₹306.80

B. ₹313.80

C. ₹316.80



D. ₹323.80

Q18 Mathematics

If the volume of a sphere is divided by its surface area, the result is 9 cm. The radius (in cm) of the sphere is _____.

A. 18

B. 4.5

C. 81

D. 27



Q19 Mathematics

What is the measure of each interior angle of a regular hexagon?

A. 90°

B. 110°

C. 120°



D. 150°

Q20 Mathematics

If the sum of the immediate successors of two given numbers is 40 and the difference of the two given numbers is 6, then the two given numbers are _____.

A. 24 and 14

B. 22 and 18

C. 22 and 16



D. 25 and 13



Q21 Mathematics

Find the value of $4^{-5} \div 4^7 \times 4^{-6}$.

A. 4^{-14}

B. 4^{-16}

C. 4^{-18} ✓

D. 4^{-20}

Q22 Mathematics

The speed of a car is 20 metres/second. The distance (in kilometres) travelled by the car in 2 hours and 20 minutes is:

A. 158

B. 162

C. 166

D. 168 ✓

Q23 Mathematics

Simplify the following expression:

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A}$$

A. $2 \cos A$

B. $2 \sin A$

C. $2 \sec A$ ✓

D. $1 + 2 \sin A$

Q24 Mathematics

A dealer claims to sell his goods at cost price but uses a weight that actually weighs 800 gm though 1 kg is written on it. Find his gain percentage.

A. 20%

B. 18%

C. 25% ✓

D. 15%



The volume (in m^3) of a cuboidal tank, whose dimensions are given as $6 \text{ m} \times 5 \text{ m} \times 4 \text{ m}$, is:

A. 120



B. 80

C. 40

D. 30



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The value of $2405 \div 13 \times 6 + 35$ is:

A. 1035

B. 1305

C. 1145



D. 1235

Q2 Mathematics

Let Chennai and Trivandrum be two stations 690 km apart. A train starts from Chennai at 8:00 p.m. and travels towards Trivandrum at a speed of 75 km/h. Another train starts from Trivandrum at 9:00 p.m. and travels towards Chennai on the parallel track at a speed of 60 km/h. At what time will they meet?

A. 01:03:40 a.m.

B. 01:23:30 a.m.

C. 01:43:20 a.m.

D. 01:33:20 a.m.



Q3 Mathematics

An open water drum is in the form of a cylinder. The height of the drum is 7 m and its internal diameter is 21 m. Find the area (in m^2) that needs to be painted if one wants to paint the inside of the drum.

Take $\pi = \frac{22}{7}$

A. 577.5

B. 462

C. 808.5



D. 1155



Q4 Mathematics

A man purchased two varieties of apples at the rate of ₹2 for 3 apples and ₹1 per apple, respectively. If he purchased an equal number of apples of each variety and then sold all his apples at ₹1 per apple, what was his profit percentage?

A. 15%

B. 18%

C. 20% ☒

D. 22%

Q5 Mathematics

The average weight of 11 students is 50 kg. When the teacher's weight of 70 kg is added to the total, then the new average will be:

A. 51.66 ☒

B. 50.66

C. 51.36

D. 53.66

Q6 Mathematics

If the area of a square is 11025 cm^2 , then the length of its diagonal is:

A. $115\sqrt{2} \text{ cm}$ B. $105\sqrt{2} \text{ cm}$ ☒C. $125\sqrt{2} \text{ cm}$ D. $135\sqrt{2} \text{ cm}$ **Q7 Mathematics**

Simplify the given expression.

$$[13 - (-2) \times \{6 - (7 - 3)\}] \div [4 \times \{5 + (-2) \times (-6)\}]$$

A. $-\frac{1}{3}$ B. $\frac{1}{4}$ ☒C. $\frac{7}{34}$ D. $-\frac{17}{68}$ 

Q8 Mathematics

Convert $0.2\bar{6}$ into a proper fraction.

A. $\frac{4}{15}$



B. $\frac{5}{17}$

C. $\frac{7}{33}$

D. $\frac{8}{21}$

Q9 Mathematics

What percentage of 1 is $6\frac{3}{4}$?

A. 625

B. 525

C. 575

D. 675



Q10 Mathematics

The price of bananas is ₹x per kg. If the price per kg of apples is ₹5 more than the price per kg of bananas, then the price (in ₹) of 5 kg of apples and 3 kg of bananas is:

A. $8x + 25$



B. $6x + 25$

C. $8x + 20$

D. $6x + 20$

Q11 Mathematics

A man purchased 50 dozen bananas for a certain amount. He could not sell five dozen of those bananas as they were spoiled. He sold two-thirds of the good bananas at a profit of 20% per dozen and sold the remaining good bananas at a profit of 5% per dozen. What was his loss or gain percentage in the whole transaction?

A. 3.5% loss

B. 3.5% gain



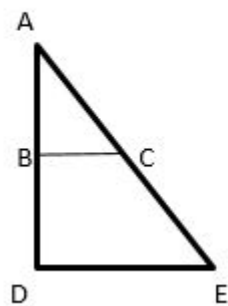
C. 2.5% loss

D. 2.5% gain



Q12 Mathematics

Given that $\triangle ABC$ and $\triangle ADE$ are similar, which of the following options is necessarily true?



A. $\frac{BC}{BD} = \frac{CE}{DE}$

B. $\frac{EC}{AC} = \frac{AD}{DE}$

C. $\frac{AB}{AD} = \frac{BC}{DE}$

D. $\frac{BC}{BD} = \frac{AB}{AC}$

Q13 Mathematics

If $x + \frac{1}{x} = 3$, then $x^6 + \frac{1}{x^6}$ is:

A. 927

B. 414

C. 364

D. 322

Q14 Mathematics

The volume of a cuboid is $5a^2 - 80b^2$. Which of the options below can be possible dimensions of the cuboid?

A. $5, 2a - b, 2a + b$

B. $5, 2a - b, a + 2b$

C. $5, a - b, a + 4b$

D. $5, a - 4b, a + 4b$



Q15 Mathematics

If 3 is a root of the equation $x^2 - px + 15 = 0$ and the quadratic equation $x^2 + px + q = 0$ has equal roots, then the value of q is:

A. 64

B. 12

C. 16



D. 32

Q16 Mathematics

The value of $16^3 - 12^3$ is:

A. 2358

B. 2368



C. 2378

D. 2388

Q17 Mathematics

If $a : b :: b : c$; $c = 4a$; and $b = 6$, find the positive value of c .

A. 12



B. 9

C. 8

D. 7

Q18 Mathematics

Simplify the given expression.

$$6.5 \times [22.6 \div \{14.5 + 2.8 - 4.2 \div 0.7\}]$$

A. 13



B. 8.75

C. 6.23

D. 4



Q19 Mathematics

The difference between two numbers is 26. One number is 3 times of the other. The smaller number is:

A. 13



B. 26

C. 39

D. 52

Q20 Mathematics

What is $6^0 \times 4^2 \times 2^{-4}$?

A. 0

B. 1



C. 2

D. 4

Q21 Mathematics

Evaluate

$$.1 \times .1 \times .1 + .02 \times .02 \times .02$$

$$.2 \times .2 \times .2 + .04 \times .04 \times .04$$

A. 0.5

B. 0.25

C. 0.125



D. 0.0125

Q22 Mathematics

The average score of a cricketer for 10 matches is 40 runs. If the average for the first six matches is 44, then the average runs of the last four matches is:

A. 20

B. 42

C. 34



D. 38



Q23 Mathematics

A sum of money is to be distributed among the partners A, B and C in the proportion of $3 : 2 : 1\frac{1}{3}$. If A gets ₹1,500 more than B, then C's share is:

A. ₹3,750

B. ₹2,500

C. ₹2,000



D. ₹3,400

Q24 Mathematics

Which of the following is a quadratic equation written in standard form?

A. $5x^2 + 3 = \frac{1}{x}$

B. $x^3 + 5x^2 + 3 = x^4$

C. $5x^2 + 3x - 1 = 0$



D. $x^{-2} + 7x = 8$

Q25 Mathematics

Out of his total monthly salary, Mohan spends 20% on house rent and 50% of the rest is his total household expenditure. If he saves ₹10,600, then his total monthly salary is:

A. ₹25,000

B. ₹26,500



C. ₹24,500

D. ₹27,000



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The value of $\frac{\sin(90^\circ - \theta) \cos(90^\circ - \theta) \cot(90^\circ - \theta)}{\cos^2 \theta - 1}$ is _____.

- A. $2\sin\theta\cos\theta$
- B. -1
- C. 0
- D. $\tan \theta$

Q2 Mathematics

What kind of roots does the quadratic equation $5x^2 + 7x + 4 = 0$ have?

- A. Real and equal roots
- B. Real and unequal roots
- C. No real roots
- D. Only one real root

Q3 Mathematics

The price of a laptop in a shop is decreased by 35%, as a result of which the sales increased by 20%. What is the effect on the total revenue of the shop from the sale of laptops?

- A. 10% decrease
- B. 22% decrease
- C. 10% increase
- D. 18% increase

Q4 Mathematics

Two adjacent angles of a parallelogram are such that one is two-thirds the other. Find the measure of the smaller angle.

- A. 18°
- B. 108°
- C. 72°
- D. 36°



Q5 Mathematics

Which of the following pairs of numbers are co-prime?

A. 59, 97



B. 65, 91

C. 51, 119

D. 133, 171

Q6 Mathematics

The radius of the base of a cylinder is increased from 4 cm to 16 cm, but its curved surface area remains unchanged. If the initial height of the cylinder was 4 cm, what will be its new height?

A. 4 cm

B. 1 cm



C. 2 cm

D. 3 cm

Q7 Mathematics

If the ratio of the areas of two squares is 2:3, then the ratio of the perimeters of these two squares, in the order mentioned, is _____.

A. 4 : 9

B. $\sqrt{2} : 3$

C. $2 : \sqrt{3}$

D. $\sqrt{2} : \sqrt{3}$



Q8 Mathematics

The median of the observations below, given in ascending order, is $n - 1$.

4, 8, $n - 14$, 17, $n + 5$, 30, 32 and 35

What is the value of n ?

A. 19

B. 17

C. 18

D. 24



Q9 Mathematics

The distance between two stations, Delhi and Amritsar is 450 km. A train starts at 4 p.m. from Delhi and moves towards Amritsar at an average speed of 60 km/h. Another train starts from Amritsar at 3:20 p.m. and moves towards Delhi at an average speed of 80 km/h. At what distance from Delhi will the two trains meet?

A. 170 km



B. 160 km

C. 180 km

D. 165 km

Q10 Mathematics

If ₹3.50 : ₹7.50 :: ₹8.26 : x, then what is the value of x?

A. ₹17.70



B. ₹17.00

C. ₹18.10

D. ₹17.85

Q11 Mathematics

The lengths of corresponding sides of two similar triangles are in the ratio 5 : 6. The areas of these triangles are in the ratio:

A. 3 : 4

B. 25 : 36



C. 16 : 42

D. 36 : 25

Q12 Mathematics

Seven toy cars and five toy bikes together cost ₹600. Five toy cars and three toy bikes together cost ₹400. The cost of each toy car is:

A. ₹200

B. ₹150

C. ₹100

D. ₹50



Q13 Mathematics

Simplify the given expression.

$$11.\overline{4565} \div 2.\overline{67}$$

A. $4\frac{2}{25}$

B. $3\frac{7}{25}$

C. $4\frac{7}{25}$ ✓

D. $3\frac{4}{25}$

Q14 Mathematics

The compound interest in 2 years on ₹30,000 at 7% interest per annum, compounded annually, is _____.

A. ₹4,437

B. ₹4,347 ✓

C. ₹4,447

D. ₹4,777

Q15 Mathematics

Anand bought a car for ₹8,00,000 and sold it at a profit of 5% to Dhiraj. Dhiraj sold it at a loss of 4% to Anil. What is the amount paid by Anil for the car?

A. ₹8,06,400 ✓

B. ₹8,40,000

C. ₹8,60,000

D. ₹8,73,600

Q16 Mathematics

Factorise $(64x^6 - y^6)$.

A. $(2x - y)(2x + y)(4x^2 + 2xy + y^2)(4x^2 - 2xy + y^2)$ ✓

B. $(2x - y)(2x + y)(4x^2 + 2xy + y^2)(4x^2 - 2xy - y^2)$

C. $(2x - y)(2x + y)(4x^2 - 2xy + y^2)(4x^2 - 2xy - y^2)$

D. $(2x - y)(2x + y)(4x^2 + 2xy - y^2)(4x^2 - 2xy + y^2)$



Q17 Mathematics

Which of the following is the standard representation of quadratic equation $(x - 4)(x + 1) = 2$?

A. $x^2 - 3x - 4 = 0$

B. $x^2 - 4x - 2 = 0$

C. $x^2 - 3x - 6 = 0$ ✓

D. $x^2 - x - 2 = 0$

Q18 Mathematics

Two consecutive numbers are such that one-fourth of the smaller number exceeds one-fifth of the larger number by 3. The larger number is _____.

A. 25

B. 45

C. 65 ✓

D. 75

Q19 Mathematics

The greatest number which on dividing 50, 58 and 69 leaves remainders of 1, 2 and 6, respectively, is:

A. 0

B. 8

C. 6

D. 7 ✓

Q20 Mathematics

Simplify the given expression.

$$11 - \{7 - 56 \div (2 \times 3 + 1)\}$$

A. 12 ✓

B. 11

C. 10

D. 9



Q21 Mathematics

If $10:16::30:y$, then find the value of y .

A. 40

B. 42

C. 48



D. 54

Q22 Mathematics

Which of the following expressions is correct?

1. $\text{Mode} - \text{median} = 2 (\text{median} - \text{mean})$

2. $\text{Median} = \frac{\text{Mode} + \text{median}}{2}$

3. $\text{Mode} = 2 \text{ Median} - \text{mean}$

4. $\text{Mean} = \frac{2\text{Median} - \text{mode}}{2}$

A. 1



B. 2

C. 4

D. 3

Q23 Mathematics

The value of $0.8\bar{7}$ is _____.

A. $\frac{87}{9}$

B. $\frac{8}{90}$

C. $\frac{79}{90}$



D. $\frac{7}{90}$



Q24 Mathematics

The total amount payable for completing a piece of work is ₹800. C can do it alone in 24 days, while B can do it alone in 8 days. With the help of A, they complete this work in 3 days. What is the sum of money received by A as his share in completing the work?

A. ₹450

B. ₹350

C. ₹400



D. ₹300

Q25 Mathematics

The cost of a pen is twice the cost of a pencil. If the cost of the pencil is ₹1, the cost of 3 pens and 2 pencils is:

A. ₹2

B. ₹7

C. ₹8



D. ₹10



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The equation $(x + 1)^3 - (x - 1)^3 = 0$ is:

- A. a quadratic equation with real roots
- B. a quadratic equation with non-real roots ✓
- C. a linear equation with real roots
- D. a linear equation with non-real roots

Q2 Mathematics

A father is four times as old as his son. After 10 years the father's age will be 2.5 times that of his son. Find the son's present age.

- A. 40 years
- B. 10 years ✓
- C. 15 years
- D. 60 years

Q3 Mathematics

The circum-centre of a triangle is the:

- A. point of concurrence of its altitudes
- B. point of concurrence of its medians
- C. point of concurrence of bisectors of angles
- D. point of concurrence of perpendicular bisectors of its sides ✓

Q4 Mathematics

If $x + \frac{1}{x} = 8$, then the value of $x^3 + \frac{1}{x^3}$ is:

- A. 688
- B. 588
- C. 488 ✓
- D. 388



Q5 Mathematics

The following observations are arranged in ascending order.

29, 32, 48, 50, x , $x + 2$, 72, 78, 84, 95

If the median is 63, then the value of x is:

A. 62



B. 31

C. 63

D. 50

Q6 Mathematics

If three taps are opened together, a tank is filled in 12 hrs. One of the taps can fill it in 10 hrs and another in 15 hrs, whereas the third pipe is a drainpipe that empties the tank. In how much time can the third pipe can empty the filled tank when no other pipe is open?

A. 11 hrs

B. 12 hrs



C. 10 hrs

D. 9 hrs

Q7 Mathematics

Find the scale with the greatest possible length which can measure poles of length 3 m 96 cm, 5m 28 cm, and 7 m 92 cm exact number of times.

A. 1 m 32 cm



B. 3 m 21 cm

C. 66 cm

D. 33 cm

Q8 Mathematics

The HCF and the LCM of two numbers are 15 and 300, respectively. If the difference of the two numbers is 15, find the sum of those two numbers.

A. 135



B. 140

C. 130

D. 145



Q9 Mathematics

A watch passes through three hands and each gains 25%. If the third seller sells the watch for ₹1,250, the cost price of the watch to the first seller is:

A. ₹540

B. ₹740

C. ₹640



D. ₹840

Q10 Mathematics

The area (in cm^2) of a triangle, the lengths of whose sides are 5 cm, 7 cm and 8 cm, is _____.

A. 280

B. 140

C. $10\sqrt{3}$ D. $60\sqrt{3}$ **Q11 Mathematics**

If α, β are the roots of $px^2 + qx + r = 0$, then $\alpha^2 + \beta^2 =$ _____.

A. $2pq$ B. $\frac{q^2 - 2pr}{p^2}$ C. $\frac{q^2 + 2pr}{p^2}$ D. $-2pq$ **Q12 Mathematics**

If the curved surface area of a solid right circular cylinder is 2310 cm^2 and its radius of base is 21 cm, then the total surface area (in cm^2) of the given cylinder is _____.

(Take $\pi = \frac{22}{7}$)

A. 3696

B. 5082



C. 4250

D. 5892



Q13 Mathematics

If $a \sec A + b \tan A + c = 0$ and $a' \sec A + b' \tan A + c' = 0$, then $(bc' - b'c)^2 - (ca' - c'a)^2$ is equal to:

A. $(ab' - a'b)^2$ ✓

B. $(a'b + ab')^2$

C. $(ab + a'b')^2$

D. $(ab - a'b')^2$

Q14 Mathematics

The value of $216^{\frac{2}{3}} + \frac{1}{256^{-\frac{3}{4}}} + 32^{\frac{1}{5}} - \frac{1}{10^{-2}} - 2$ is _____.

A. 0 ✓

B. 1

C. -1

D. -2

Q15 Mathematics

If $a^2 - 4a + 1 = 0$, find $a^2 + \frac{1}{a^2}$.

A. 12

B. 14 ✓

C. 16

D. 18



Q16 Mathematics

If $a = \frac{x}{2x + y + z} = \frac{y}{x + 2y + z} = \frac{z}{x + y + 2z}$, then find the value of a.

A. $\frac{1}{2}$

B. $\frac{1}{4}$ ✓

C. $\frac{2}{5}$

D. $\frac{3}{2}$

Q17 Mathematics

At a health club, 80% of the members are men and the remaining 20% are women. The average age of the male members is 30 years and the average age of the female members is 40 years. The combined average age of all the members of this health club is _____ years.

A. 35

B. 31

C. 32 ✓

D. 33

Q18 Mathematics

The value of $[x^{m(n-p)} \cdot x^{n(p-m)} \cdot x^{p(m-n)}][\sqrt[4]{625} - \sqrt{25}]$ is _____.

A. 1

B. 5

C. 0 ✓

D. 2



Q19 Mathematics

The value of $326.\overline{786} - 10.19\overline{3}$ is:

A. $316.49\overline{575}$

B. $316.59\overline{345}$ ✓

C. $316.50\overline{365}$

D. $316.65\overline{345}$

Q20 Mathematics

The product of $(x - 5)$ and $(x + 3)$ is:

A. $x^2 - 2x - 15$ ✓

B. $x^2 + 3x - 15$

C. $x^2 + 2x + 15$

D. $x^2 + 3x + 15$

Q21 Mathematics

The price of a TV set increases by 20% in the first year and again by 5% in the next year. The net effect on the price of the TV set after two years compared to its initial price is a:

A. 25% increase

B. 20% increase

C. 15% increase

D. 26% increase ✓

Q22 Mathematics

A shopkeeper sells pulses at ₹100 per kg that he purchased for ₹80 per kg. While selling, he cheats and gives 800 g instead of 1 kg. What is his actual profit?

A. 64.00%

B. 58.00%

C. 56.25% ✓

D. 62.75%



Q23 Mathematics

If the principal amount is ₹13,000, then the simple interest for 4 years at a rate of 5% per annum is _____.

A. ₹1,300

B. ₹2,600



C. ₹2750

D. ₹5,200

Q24 Mathematics

If each interior angle of a regular polygon measures 108° , that polygon has _____ sides.

A. 4

B. 5



C. 6

D. 10

Q25 Mathematics

Two pipes A and B can fill a tank completely in 5 hours and 8 hours, respectively. Pipe C can empty the tank completely in 10 hours. If all the three pipes are opened simultaneously in an empty tank, then how much time will it take to fill the tank completely?

A. 6 hours

B. $4\frac{2}{9}$ hours

C. 3 hours

D. $4\frac{4}{9}$ hours



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Sony and Mary can complete a painting in 4 days and 6 days, respectively. They work on same painting on alternate days starting with Mary. In how many days will they together complete the painting?

A. 4.5

B. 5



C. 5.25

D. 4.75

Q2 Mathematics

If $m = -9$ and $n = 13$, find the value of $25m^2 + 40mn + 16n^2$.

A. 49



B. 64

C. 81

D. 100

Q3 Mathematics

Which of the options given below correctly describes the nature of the roots of the quadratic equation $x^2 + 4\sqrt{3}x + 3 = 0$?

A. irrational and equal

B. rational and equal

C. rational and unequal

D. irrational and unequal



Q4 Mathematics

The number $0.\overline{335}$ can be represented in the form of $\frac{P}{Q}$ (where P and Q are natural numbers) as:

A. $\frac{332}{995}$

B. $\frac{332}{895}$

C. $\frac{332}{990}$



D. $\frac{332}{980}$

Q5 Mathematics

A shopkeeper allows 18% discount on the marked price of an article and still makes a profit of 23%. If he gains ₹1,840 on the sale of the article, then what is the marked price of the article?

A. ₹12,000



B. ₹10,000

C. ₹15,000

D. ₹9,840

Q6 Mathematics

Johnny borrows ₹7,000 from a bank at simple interest. After 3 years he pays ₹4,000 to the bank, this amount being entirely adjusted as repayment of part of the principal borrowed. At the end of 5 years from the date of borrowing he pays ₹4,350 to the bank to settle the account. Find the rate of interest.

A. 4%

B. 5%



C. 6%

D. 7%



Q7 Mathematics

The expression $(3.7)^3 - 3 \times (3.7)^2 \times (0.7) + 3(3.7) \times (0.7)^2 - (0.7)^3$ is equal to:

A. 30

B. 10

C. 35

D. 27 ☒

Q8 Mathematics

If $x \neq y, z > 0$, and $(x + z)^2 : (y + z)^2 :: x : y$, then find a , where $a > 0$, such that $x : a :: a : y$.

A. $x^2 y^2$ B. $x - y$ C. $-z$ D. z ☒

Q9 Mathematics

The ratio of the present ages of A to B is 7 : 3. The ratio of A's age 4 years ago to B's age 4 years hence is 2 : 1. The difference between A's age 4 years hence and B's age 4 years ago is:

A. 46 years

B. 56 years ☒

C. 88 years

D. 36 years

Q10 Mathematics

The total cost price of 100 apples is ₹700. They are sold at a rate of ₹96 per dozen. The profit percentage is _____.

A. $8\frac{2}{3}\%$ B. $14\frac{2}{7}\%$ ☒C. $13\frac{1}{7}\%$ D. $24\frac{1}{7}\%$ 

Q11 Mathematics

The volume (in cm^3) of a right circular cone, whose slant height is 28 cm and radius of base is 21 cm, is _____. (Take $\pi = \frac{22}{7}$)

A. 38808

B. $3234\sqrt{7}$ ✓

C. $1617\sqrt{7}$

D. 30808

Q12 Mathematics

Raju's age after 30 years will be 2 times his age 4 years ago. The present age of Raju is:

A. 42 years

B. 40 years

C. 38 years ✓

D. 36 years

Q13 Mathematics

Five years ago the sum of the ages of A and B was 58 years. The difference between B's age 8 years ago and A's age 8 years hence is 16 years. The ratio of the present ages of A and B is:

A. 9 : 25 ✓

B. 25 : 9

C. 36 : 52

D. 5 : 13

Q14 Mathematics

For a certain number of observations the median is 55 and the mean is 58. Find the mode.

A. 50

B. 49 ✓

C. 51

D. 52



Q15 Mathematics

The measures of three angles of a quadrilateral are given as 110° , 55° and 125° . The measure of its fourth angle is _____.

A. 110° B. 60° C. 90° D. 70° ✓**Q16** Mathematics

Two trains start at the same time from A and B and proceed towards each other at speeds of 85 km per hour and 105 km per hour, respectively. When they meet, it is found that train from B has travelled 200 km more than the train from A. The distance between A and B is:

A. 1950 km

B. 1800 km

C. 1900 km ✓

D. 2000 km

Q17 Mathematics

The value of $40 - [3 - \{4 - (6 - \overline{6-4})\}]$ is _____.

A. 300

B. 100

C. 37 ✓

D. 47

Q18 Mathematics

The length of each edge of a cube is increased by 50%. The percentage increase in the surface area is:

A. 25 %

B. 125% ✓

C. 150%

D. 225%



Q19 Mathematics

The product of the HCF and the LCM of 4, 20, 28 is:

A. 560



B. 140

C. 564

D. 136

Q20 Mathematics

A hollow cylinder of height h has inner and outer radii of base given as r and R , respectively. The ratio of the curved surface area to the total surface area of this cylinder is:

A. $h : (h + R - r)$



B. $(R + r - h) : h$

C. $(R - r - h) : r$

D. $h : (R - r - h)$

Q21 Mathematics

Which of the numbers below is exactly divisible by 33?

A. 19679

B. 27441

C. 73205

D. 25080

**Q22** Mathematics

A train travels at a speed of 30 km/h for 6 hours and at 45 km/h for 4 hours. What is the average speed of the train during these 10 hours?

A. 35 km/h

B. 36 km/h



C. 40 km/h

D. $37\frac{1}{2}$ km/h



Q23 Mathematics

If $\cot A + \cos A = m$ and $\cot A - \cos A = n$, then:

A. $m^2 - n^2 = 16 mn$

B. $(m^2 - n^2)^2 = 4 mn$

C. $(m^2 - n^2)^2 = 16 mn$ ✓

D. $m^2 + n^2 = 4 mn$

Q24 Mathematics

If one angle of a quadrilateral measures 120° and its remaining three angles are equal in measure to one another, then the measure of each of these three remaining angles is equal to _____.

A. 110°

B. 80° ✓

C. 60°

D. 90°

Q25 Mathematics

The roots of $2^{2x} - 10 \times 2^x + 16 = 0$ are:

A. 2, 8

B. 1, 3 ✓

C. 1, 8

D. 2, 3



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The ratio of the present ages of Shinjan and Aamyia is 3 : 4. After 10 years this ratio will become 5 : 6. The present age (in years) of Aamyia is:

A. 18

B. 60

C. 20



D. 65

Q2 Mathematics

In a rectangle PQRS, if $m\angle QPR = 26^\circ$, then $m\angle SQR =$ _____.

A. 26° B. 52° C. 64° D. 74°

Q3 Mathematics

Bina and Neena together weave one dozen sweaters in 8 days working for 10 hours per day. If they have to finish the work in 5 days, for how many hours should they work per day?

A. 16



B. 12

C. 14

D. 11

Q4 Mathematics

First find the median of 46, 64, 87, 41, 58, 77, 35, 90, 55, 92, and 33. If 92 is replaced with 99 and 41 is replaced with 43 in the data, then find the new median. What is the difference between the old median and the new median?

A. 6

B. 3

C. 2

D. 0



Q5 Mathematics

Arindam purchased a coat for ₹2,100 after getting a discount of 20% and but then paying GST at a rate of 5% on the discounted price. Find the marked price of the coat.

A. ₹2,490

B. ₹2,520

C. ₹2,480

D. ₹2,500 ☒**Q6 Mathematics**

Each side of an equilateral triangle is 6 cm long. What is its area (in cm^2)?

A. 210

B. $6\sqrt{3}$ C. $21\sqrt{3}$ D. $9\sqrt{3}$ ☒**Q7 Mathematics**

The marked price of an article is ₹7,200. Two successive discounts of 9% and 15% are offered. Find the selling price of the article.

A. ₹5,472.00

B. ₹6,400.00

C. ₹5,569.20 ☒

D. ₹5,600.00

Q8 Mathematics

Let r be the greatest number which when divides 41, 71 and 91 leaves the same remainder. Find the LCM of r and 45.

A. 45

B. 90 ☒

C. 10

D. 75



Q9 Mathematics

If $x = a \sec^n \theta$, $y = b \tan^n \theta$, then:

A. $\left(\frac{x}{a}\right)^{2/n} - \left(\frac{y}{b}\right)^{\frac{2}{n}} = 1$



B. $\left(\frac{a}{x}\right)^{2/n} - \left(\frac{b}{y}\right)^{\frac{2}{n}} = 1$

C. $\left(\frac{x}{a}\right)^{2/n} + \left(\frac{y}{b}\right)^{\frac{2}{n}} = 1$

D. $\left(\frac{a}{x}\right)^{2/n} + \left(\frac{b}{y}\right)^{\frac{2}{n}} = 1$

Q10 Mathematics

The positive root of $4x^2 - 1 = 0$ is:

A. 2

B. $\frac{1}{4}$

C. $\frac{1}{2}$



D. 1



Q11 Mathematics

Study the given table and answer the question that follows.

The table show the percentage of marks obtained by a candidate in five subjects and the weightage given to the subjects, in an examination.

Subject	English	Hindi	Maths	Social Studies	Science
Marks Percentage	90	92	93	78	86
Weightage to subjects	2	2	3	1	2

Find the difference between the weighted average and the average if all subjects had equal weightage.

- A. 2%
- B. 1%
- C. 1.5%
- D. 0.5%

**Q12** Mathematics

If $\sqrt{21} = 4.58$, then the value of $\sqrt{\frac{7}{3}}$, correct to 3 decimal places, is:

- A. 1.520
- B. 1.521
- C. 1.523
- D. 1.527

**Q13** Mathematics

If one of the roots of a quadratic equation with rational coefficients is $2 + \sqrt{3}$, then the quadratic equation is given as _____.

- A. $x^2 - 2 = 0$
- B. $x^2 = 2 - \sqrt{3}$
- C. $x^2 - 4x + 1 = 0$
- D. $x^2 + 4x - 1 = 0$



Q14 Mathematics

If $(x + y + z) = 0$ and $x^2 + y^2 + z^2 = 36$, then the value of $xy + yz + zx$ is:

- A. 18
- B. -28
- C. -6
- D. -18

**Q15** Mathematics

If $a + \frac{1}{a} = 9$, then the value of $a^3 + \frac{1}{a^3}$ is:

- A. 732
- B. 702
- C. 729
- D. 726

**Q16** Mathematics

What is the smallest natural number by which 217800 must be multiplied so that the product is a perfect square?

- A. 2
- B. 3
- C. 4
- D. 5

**Q17** Mathematics

When a man travels equal distances at speeds of V_1 and V_2 km/h, his average speed is 5 km/h. But when he travels at these speeds for equal time periods, his average speed is 5.5 km/h. Find the positive difference between the two speeds.

- A. $\sqrt{10}$ km/h
- B. 10 km/h
- C. 11 km/h
- D. $\sqrt{11}$ km/h



Q18 Mathematics

The value of $(x^{\frac{2}{3}} - x^{\frac{1}{3}}y^{\frac{1}{3}} + y^{\frac{2}{3}})(x^{\frac{1}{3}} + y^{\frac{1}{3}})$ is _____.

A. $x - y$

B. $\frac{1}{x} + \frac{1}{y}$

C. $x + y$ ✓

D. $\frac{1}{x} - \frac{1}{y}$

Q19 Mathematics

₹3,903 is divided between A and B, so that A's share at the end of 7 years will be equal to B's share at the end of 9 years, with interest being compounded annually at the rate of 4% per annum. The share of A is:

A. ₹2,028 ✓

B. ₹1,875

C. ₹1,828

D. ₹2,075

Q20 Mathematics

A field is in the form of a triangle. Its area is 25000 m^2 and the length of the base is 500 m. Its height (in m), corresponding to the given base, is _____.

A. 50

B. 100 ✓

C. 175

D. 200

Q21 Mathematics

If the monthly salary of a person is ₹28,000 and the expenditure for the month is 92% of his salary, then the remaining amount from that month's salary is _____.

A. ₹2,200

B. ₹2,240 ✓

C. ₹2,340

D. ₹2,400



Q22 Mathematics

What is the smallest positive fraction that must be added to the fraction $\frac{3}{5} \times \frac{16}{21} \times \frac{7}{10} \times \frac{3}{4}$ to make it a whole number?

A. $\frac{20}{5}$

B. $\frac{23}{2}$

C. $\frac{19}{25}$ ✓

D. $\frac{19}{16}$

Q23 Mathematics

The ratio of the present ages of Monu and Sonu is 3 : 4. The ratio of the age of Monu 5 years ago and that of Sonu 5 years hence is 2 : 5. Find Monu's present age.

A. 15 years ✓

B. 20 years

C. 18 years

D. 66 years

Q24 Mathematics

The measures of three angles of a quadrilateral are given as 90° , 96° and 88° . The measure of its fourth angle is _____.

A. 82°

B. 86° ✓

C. 88°

D. 96°



Which of the following statements is NOT correct?

1. There are only four single-digit prime numbers.
2. There are infinitely many prime numbers.
3. A prime number has only two factors.
4. All prime numbers are odd.

A. 1

B. 2

C. 3

D. 4



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A sum is borrowed for two years at the rate of 5% compound interest per annum, compounded annually. If it is paid back in two equal annual instalments of ₹882, then the sum borrowed is:

A. ₹1,560

B. ₹1,740

C. ₹1,680

D. ₹1,640



Q2 Mathematics

Four years ago the ratio of the age of the son to that of his father was 2 : 7 and 10 years hence it will change to 3 : 7. The positive difference between their ages is:

A. 60 years

B. 40 years

C. 50 years

D. 30 years



Q3 Mathematics

If $\frac{y}{x} = \frac{5}{6}$, then $\frac{x^2 - y^2}{x^2 + y^2} = \underline{\hspace{2cm}}$.

A. $\frac{25}{36}$ B. $\frac{36}{25}$ C. $\frac{11}{61}$ D. $\frac{9}{61}$ 

Q4 Mathematics

Five years ago, Roshan was three times as old as Preethi. If the difference between their ages is 6 years, the present age (in years) of Preethi is _____.

A. 4

B. 8



C. 7

D. 6

Q5 Mathematics

One pipe can fill a tank three times as fast another one. Both the pipes opened together can fill the tank completely in 36 minutes. In how many hours will the faster pipe alone fill the empty tank completely?

A. $\frac{1}{2}$ B. $\frac{4}{5}$ C. $\frac{12}{5}$ D. $\frac{8}{5}$ **Q6 Mathematics**

Successive discounts of 10% and 20% are equivalent to a single percentage discount of:

A. 22%

B. 30%

C. 28%



D. 27.5%

Q7 Mathematics

The product of two consecutive positive integers is 552. If the smaller of these two integers is represented by x, which of the options below will correspond to the equation for finding out the value of x?

A. $x^2 + x + 552 = 0$ B. $x^2 + x - 552 = 0$ C. $x^2 - x + 552 = 0$ D. $x^2 - x - 552 = 0$ 

Q8 Mathematics

How many sides will a polygon have if the sum of the measures of its interior angles is 900° ?

A. 6

B. 7



C. 54

D. 8

Q9 Mathematics

If $\sqrt{6} = 2.45$, then the value of $\sqrt{6} + \sqrt{24} + \sqrt{54}$ is:

A. 15.70

B. 14.70



C. 15.75

D. 13.75

Q10 Mathematics

If the radius of a sphere is 7 cm, then the surface area in (cm^2) of the sphere is _____.

(Take $\pi = \frac{22}{7}$)

A. 243

B. 616



C. 343

D. 729

Q11 Mathematics

Select the smallest natural number that should be added to or subtracted from the sum of the squares of 15 and 16 to make it a perfect square?

A. 81

B. 3



C. 40

D. 19



Q12 Mathematics

The dimensions of a cuboidal storage space are 20 m, 25 m, and 10 m. How many boxes of dimension $2\text{ m} \times 1.25\text{ m} \times 1\text{ m}$ can be kept in it?

A. 2000



B. 4000

C. 6000

D. 8000

Q13 Mathematics

If 8 – digit number $27x65y31$ is divisible by 3, find the lowest possible positive value of $x \times y$.

A. 1

B. 3

C. 4

D. 2

**Q14** Mathematics

The ratio of the present ages of Somu and Ramu is $5 : 4$ and the sum of their ages is 27 years. The ratio of their ages after 8 years will be _____.

A. $3 : 4$

B. $25 : 29$

C. $23 : 20$



D. $8 : 3$

Q15 Mathematics

In a triangle, if the measure of one of its angles is twice the measure of the smallest angle of the same triangle, and the measure of the third angle of the triangle is three times the measure of the smallest angle of the same triangle, then the measure of the greatest angle of the given triangle is _____.

A. 75°

B. 70°

C. 90°



D. 120°



Q16 Mathematics

₹651 is divided among A, B, C in such a way that twice of A's share, thrice of B's and five times of C's share are equal. Find C's share.

A. ₹126



B. ₹315

C. ₹210

D. ₹150

Q17 Mathematics HINDI - no English version saved

किसी व्यक्ति ने एक घोड़े को 7% की हानि पर बेचा। यदि वह घोड़े को 9% के लाभ पर बेचता, तो उसे इस घोड़े को 7% की हानि पर बेचने से प्राप्त राशि की तुलना में ₹6,400 अधिक प्राप्त होते। घोड़े का क्रय मूल्य कितना था?

A. ₹50,000

B. ₹40,000



C. ₹45,000

D. ₹55,000

Q18 Mathematics

The value of $(\sin x + \sec x)^2 + (\operatorname{cosec} x + \cos x)^2$ is:

A. $(1 - \sec x \operatorname{cosec} x)^2$ B. $(2 - \sec x \operatorname{cosec} x)^2$ C. $(\sec x \operatorname{cosec} x + 1)^2$ D. $(2 + \sec x \operatorname{cosec} x)^2$ 

Simplify the given expression.

$$\frac{76 \times 76 \times 76 - 74 \times 74 \times 74}{76 \times 76 + 76 \times 74 + 74 \times 74}$$

A. 2



B. 120

C. 5

D. 121

Which of the numbers below is divisible by all the natural numbers from 1 to 10 (both inclusive)?

A. 100

B. 608

C. 2520



D. 10

Mrdul's working hours per day increased by 25% and his hourly wages increased by 20%. By how much per cent did his daily earnings increase?

A. 46%

B. 50%



C. 40%

D. 30%

If the two roots of a quadratic equation are -3 and 3 , then the quadratic equation is given as _____.

A. $x^2 + 5 = 0$ B. $x^2 - 9 = 0$ C. $9x^2 - 1 = 0$ D. $x^2 - 6 = 0$ 

Q23 Mathematics

Study the given table and answer the question that follows.

The table shows the demand of different shoe sizes as obtained in a survey.

Shoe size	Number of pairs demanded
5	44
6	48
7	58
8	46
9	39
10	37

Find the modal size of shoes demanded that one can obtain from the survey.

A. 6

B. 7



C. 5

D. 9

Q24 Mathematics

Two trains 240 m and 320 m long are travelling on parallel tracks in the same direction at speeds of 59 km/h and 50 km/h. How long will it take for the two trains to pass each other from the instant they meet?

A. 2 min 24 sec

B. 3 min 44 sec



C. 3 min 24 sec

D. 2 min 18 sec

Q25 Mathematics

Find the median age, given the ages of 10 persons (in years) are as follows:

22, 23.5, 26, 22.5, 24, 26, 23, 24.5, 25, 21

A. 22.00

B. 22.25

C. 25.00

D. 23.75



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Express $123.4\overline{7}$ in $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$.

A. $\frac{12347}{99}$

B. $\frac{11113}{9}$

C. $\frac{12347}{90}$

D. $\frac{11113}{90}$ ✓

Q2 Mathematics

When a transversal intersects two straight lines, two angles formed on the same side of the transversal, such that the two angles are both positioned above or are both positioned below relative to the two lines on which they are formed, are known as a pair of _____ angles.

A. adjacent

B. corresponding ✓

C. complementary

D. alternate

Q3 Mathematics

If $x^3y : xy :: xy : a$, then which of the options below gives the value of a ?

A. $\frac{y}{x}$ ✓

B. $\frac{y}{x^2}$

C. $\frac{y^2}{x}$

D. $\frac{y^2}{x^2}$



Q4 Mathematics

A dishonest dealer professes to sell his goods at cost price, but he uses a weight of 950 gm for a kilogram. His gain per cent is:

A. $5\frac{5}{19}\%$



B. $4\frac{5}{19}\%$

C. $6\frac{5}{19}\%$

D. $7\frac{5}{19}\%$

Q5 Mathematics

If a, b are the roots of the equation $x^2 - 5x + 6 = 0$, then $a^2 + b^2 - ab$ is:

A. -7

B. 43

C. 7



D. 9

Q6 Mathematics

What is the sum of the deviations of the values of the data set 5, 6, 7, 9, 10, 12 and 14, from the mean of the values given in the same data set?

A. 0



B. -1

C. 1

D. 2

Q7 Mathematics

Three cubes, each of edge 5 cm are arranged next to each other. The surface area of the resulting cuboid is:

A. 27 cm^2

B. 37.5 cm^2

C. 350 cm^2



D. 125 cm^2



Q8 Mathematics

Find b if 256, b and 324 are in continued proportion.

A. 312

B. 308

C. 288



D. 296

Q9 Mathematics

When the price of an article is increased by 20% its sale reduces by 20%. What is the net effect on the revenue?

A. 20% increase

B. 20% decrease

C. 4% decrease



D. 4% increase

Q10 Mathematics

A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm, and 30 cm and the parallelogram stands on a base of 28 cm, then the height of the parallelogram is:

A. 12 cm



B. 10 cm

C. 14 cm

D. 11 cm

Q11 Mathematics

Find the value of $9\frac{1}{6} \times 4\frac{2}{3} + 5\frac{1}{2} \div 2\frac{2}{3}$.

A. $\frac{6457}{144}$



B. $\frac{6417}{144}$

C. $\frac{6457}{72}$

D. $\frac{6157}{144}$



Q12 Mathematics

The value of $\frac{\sin A - \sin B}{\cos A + \cos B} + \frac{\cos A - \cos B}{\sin A + \sin B}$ is:

A. 1

B. -1

C. 2

D. 0



Q13 Mathematics

What will be the area (in cm^2) of a semicircle whose perimeter is 72 cm? (Take $\pi = \frac{22}{7}$)

A. 144

B. 154

C. 616

D. 308



Q14 Mathematics

A and B have the same annual income. A saves one-fifth of his income but B spends ₹80,000 more than A annually and at the end of 4 years finds himself in a debt of ₹2,20,000. Each of A and B's annual income is:

A. ₹1,10,000

B. ₹1,30,000

C. ₹1,20,000

D. ₹1,25,000



Q15 Mathematics

If the HCF of two numbers is 6 and the product of the numbers is 2520, find their LCM.

A. 2520

B. 420

C. 1320

D. 880



Q16 Mathematics

If the area of an equilateral triangle is $25\sqrt{3}\text{ cm}^2$, then the length (in cm) of each side of this equilateral triangle is _____.

A. $5\sqrt{2}$

B. $10\sqrt{3}$

C. 10



D. 8

Q17 Mathematics

The weights (in kg) of 10 students of a class have been recorded as 35, 42, 56, 44, 55, 44, 36, 44, 49 and 35. Find the modal weight.

A. 44.0 kg



B. 35.0 kg

C. 36.0 kg

D. 35.5 kg

Q18 Mathematics

If $x = -\frac{1}{2}$ and $y = 2$, find the value of $\frac{4y}{5}(y - x) - 35 \left[\frac{3x - 4y}{5} - \frac{1}{10} \left\{ 3x - \frac{5}{7}(7x - 4y) \right\} \right]$.

A. 90

B. 94



C. 92

D. 91

Q19 Mathematics

The product of the roots of $6\sqrt{3}x^2 + 3\sqrt{3} + 5x = 0$ is _____.

A. $\sqrt{3}$

B. 1

C. 0

D. $\frac{1}{2}$



Q20 Mathematics

If $4^{2n+1} = 2^{3n+9}$, then $n =$ _____.

A. -8

B. 7



C. 8

D. $\frac{9}{2}$

Q21 Mathematics

The sum of two co-prime numbers is 122 and their product is 3717. The numbers are:

A. (33; 89)

B. (53; 69)

C. (59; 63)



D. (79; 43)

Q22 Mathematics

Arbaz and Aman can complete painting a building in 16 days and 12 days, respectively. If Arbaz starts the work and they work on alternate days, then the building painting will be completed in how many days?

A. $13\frac{3}{4}$



B. $15\frac{1}{4}$

C. 12

D. 13



Q23 Mathematics

A dishonest dealer sells goods at a $6\frac{1}{4}\%$ loss on cost price but actually gives 14 gm of goods for every 16 gm that is mentioned on the weight. His gain or loss percent is:

A. $7\frac{1}{7}\%$ gain



B. $7\frac{1}{3}\%$ loss

C. $6\frac{1}{7}\%$ gain

D. $6\frac{1}{7}\%$ loss

Q24 Mathematics

What is the smallest natural number that must be added to 369 to make the result a perfect square?

A. 25

B. 31



C. 30

D. 40

Q25 Mathematics

If the sum of three consecutive odd numbers is 309, then the largest number among them is _____.

A. 101

B. 109

C. 105



D. 103



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Find the third proportional to 60 and 90.

A. 120

B. 75

C. 135



D. 90

Q2 Mathematics

If the sum of the roots of a quadratic equation is -7 and product of the roots of the same equation is -12 , then the quadratic equation is given as _____.

A. $x^2 - 7 = 0$

B. $x^2 + 7x + 12 = 0$

C. $x^2 - 12 = 0$

D. $x^2 + 7x - 12 = 0$



Q3 Mathematics

G is the centroid of $\triangle ABC$. $\overline{AD}$ is a median of $\triangle ABC$ intersecting $\overline{BC}$ at D. What is the ratio of the lengths of $\overline{AG}$ and $\overline{GD}$?

A. 1 : 2

B. 2 : 1



C. 3 : 1

D. 1 : 3

Q4 Mathematics

A number added to its one-third is equal to 12. The number is _____.

A. 4

B. 3

C. 9



D. 6



Q5 Mathematics

Which of the options below is equivalent to $8x^3 + 27y^3 + 36x^2y + 54xy^2$.

A. $(3x + 2y)^3$

B. $(2x + 3y)^3$ ✓

C. $(4x + 3y)^3$

D. $(2x + 5y)^3$

Q6 Mathematics

An equation, whose roots are the reciprocals of the roots of the equation $5x^2 - 3x - 4 = 0$, is:

A. $4x^2 + 3x - 5 = 0$ ✓

B. $4x^2 - 3x - 5 = 0$

C. $4x^2 - 3x + 5 = 0$

D. $4x^2 + 3x + 5 = 0$

Q7 Mathematics

Seema is younger than Reema by 4 years. After 4 years the sum of their ages will be 44 years. What is Reema's present age?

A. 32 years

B. 16 years

C. 20 years ✓

D. 12 years

Q8 Mathematics

Two successive discounts of 15% and $\mathcal{X}\%$ on the sale of an item is equivalent to a single discount of 23.5%. What is the value of $\mathcal{X}\%$?

A. 11%

B. 10% ✓

C. 9%

D. 12%



Q9 Mathematics

The product of two numbers is 2160 and their HCF is 12. One of the possible pairs of numbers is:

A. (36, 60)



B. (12, 185)

C. (35, 60)

D. (12, 184)

Q10 Mathematics

Babli travelled for 14 hours. If she covered one-fourth of the journey at a speed of 25 km/h and the remaining at 30 km/h, what is the total distance travelled by her?

A. 225 km

B. 140 km

C. 400 km



D. 340 km

Q11 Mathematics

$\left[\left\{ (1690 - 934) \times \frac{5}{6} + 815 \right\} \div 17 \right]$ equals:

A. 27

B. 17

C. 85



D. 58

Q12 Mathematics

Anil and Sunil started a business investing equal amounts. Anil left after 9 months. They earned an annual profit of ₹28,000. What is Sunil's share of annual profit?

A. ₹15,000

B. ₹12,000

C. ₹16,000



D. ₹13,000



Q13 Mathematics

Find the mode of a moderately skewed data using empirical relation, given its mean is 222.4 and median is 216.6.

A. 218

B. 216

C. 205



D. 222

Q14 Mathematics

Ren and Martin started a company on 1 March 2019. The ratio of their investments was 5 : 4. Martin left the company after 15 months. In what ratio must the profit be divided at the end of 2 years?

A. 1 : 3

B. 2 : 1



C. 29 : 19

D. 24 : 15

Q15 Mathematics

What is the net discount, if two successive discounts of 10% and 12% are given?

A. 20.8%



B. 22.0%

C. 21.4%

D. 23.2%

Q16 Mathematics

The value of $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A}$ is:

A. $\sec A \operatorname{cosec} A - 1$ B. $\sec A \operatorname{cosec} A + 1$ C. $\sec A \sin A + 1$ D. $\operatorname{cosec} A \cos A + 1$ 

Q17 Mathematics

Shenoy borrowed ₹4,50,000 at 5% per annum compounded annually. What is the amount he has to pay at the end of 2 years?

A. ₹4,82,725

B. ₹4,65,000

C. ₹4,75,000

D. ₹4,96,125



Q18 Mathematics

If the length of each side of a cube is increased to three times its initial length, then its volume will become _____ times its initial volume.

A. 3

B. 6

C. 9

D. 27



Q19 Mathematics

Simplify

$$(731)^2 - (269)^2 = ?$$

A. 452000

B. 450000

C. 464000

D. 462000



Q20 Mathematics

The number of nonoverlapping triangles that can be formed in an 11 – sided polygon by joining the vertices are:

A. 11

B. 10

C. 8

D. 9



Q21 Mathematics

Simplify the given expression.

$$(x - y)^3 + (x + y)^3 + 3(x - y)(x^2 - y^2) + 3(x + y)(x^2 - y^2)$$

A. $8x^3$



B. x^3

C. $4x^3$

D. $6x^3$

Q22 Mathematics

At what rate per annum would a sum of ₹8,000 amount to ₹9,261 in $1\frac{1}{2}$ years, interest being compounded half-yearly?

A. 5%

B. 10%



C. 15%

D. 20%

Q23 Mathematics

Find the value of $345.08 + 56.02 + 44.44 \times 2.2 - 12.22$.

A. 498.868

B. 468.648

C. 486.684

D. 486.648



Q24 Mathematics

A cube each of whose side is 5 cm will have a total surface area of _____ cm^2 .

A. 150



B. 60

C. 80

D. 120



Find the HCF of 1248 and 2456.

A. 8



B. 12

C. 16

D. 14



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The marked price of a jacket is ₹1,050. The shopkeeper earns a profit of 25% even after giving a discount of 10%. At what cost did the shopkeeper purchase it?

A. ₹756



B. ₹905

C. ₹856

D. ₹682

Q2 Mathematics

If the length of a diagonal of a square is 18 cm, then its perimeter (in cm) is _____.

A. $24\sqrt{2}$

B. 36

C. $36\sqrt{2}$ 

D. 24

Q3 Mathematics

ABCD is a quadrilateral and E, F, G, and H are the mid-points of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{DA}$ respectively. The quadrilateral EFGH is necessarily a:

A. rectangle, but not a square

B. square

C. rhombus, but not a square

D. parallelogram



Q4 Mathematics HINDI - no English version saved

एक तार को मोड़कर एक वर्ग बनाया गया है, जिसका क्षेत्रफल 1089 cm^2 है। उसी तार को खोलकर पुनः मोड़कर एक आयत बनाया जाता है, जिसकी लंबाई 40 cm है। इस आयत की चौड़ाई ज्ञात कीजिए।

A. 22 cm

B. 6 cm

C. 11 cm

D. 26 cm



Q5 Mathematics

The diagonal of a rectangle is 26 cm. Its perimeter is 68 cm. Find its area.

A. 120 cm^2

B. 550 cm^2

C. 240 cm^2



D. 330 cm^2

Q6 Mathematics

The cost of one kg sugar in 2020 was ₹46. If the cost of sugar increased by 2.5% in one year, how much would 5 kg sugar cost in 2021?

A. ₹253.50

B. ₹235.75



C. ₹47.15

D. ₹48.50

Q7 Mathematics

If 128 is divided into two parts such that one part is three times the other, then the larger part is _____.

A. 92

B. 84

C. 104

D. 96



Q8 Mathematics

The value of $\tan^6 A + 3 \tan^2 A \sec^2 A + 1$ is:

A. $\sec^4 A$

B. $\sec^5 A$

C. $\sec^6 A$ ✓

D. $\sec^4 A + \tan^4 A$

Q9 Mathematics

If $a + b + c = 0$, then the roots of the equation $ax^2 + bx + c = 0$ are:

A. $-2, \frac{c}{a}$

B. $2, \frac{c}{a}$

C. $-1, \frac{-c}{a}$

D. $1, \frac{c}{a}$ ✓

Q10 Mathematics

The ratio of marks obtained by A and B is 3 : 4 and of those obtained by B and C is 2 : 3. What is ratio of marks obtained by A and C?

A. 1 : 2 ✓

B. 2 : 1

C. 1 : 1

D. 4 : 3



Q11 Mathematics

One-third of a certain journey is covered at a speed of 25 km/h, one-fourth of the journey is covered at a speed of 30 km/h and the rest of the journey is covered at 50 km/h. The average speed (in km/h) of the whole journey is:

A. $33\frac{1}{3}$



B. 33

C. $32\frac{1}{2}$

D. 32

Q12 Mathematics

Simplify

$$\left(\frac{1}{512}\right)^{\frac{-2}{3}} \div \left(\frac{1}{64}\right)^{\frac{-4}{3}} = ?$$

A. $\frac{3}{4}$

B. $\frac{1}{4}$



C. $\frac{2}{3}$

D. $\frac{1}{6}$



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Q13 Mathematics

Express $5.\overline{7}$ in $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$.

A. $\frac{57}{10}$

B. $\frac{52}{7}$

C. $\frac{57}{7}$

D. $\frac{52}{9}$



Q14 Mathematics

For the equation $(x + 4)(x - 4) = 0$, the value of the discriminant is equal to _____.

A. 0

B. -4

C. 16

D. 64



Q15 Mathematics

Find the mean length of a leaf, given the lengths of 10 leaves (in mm) are as follows:

146, 150, 147, 143, 158, 139, 154, 149, 151, 155

A. 149.2 mm

B. 151.9 mm

C. 139.6 mm

D. 148.2 mm



Q16 Mathematics

$(x + y + 2z)(x + y)$ can be expressed as:

A. $(x + y + z)^2 - z^2$ ✓

B. $(x - y + z)^2 - z^2$

C. $(x + y + z)^2 - y^2$

D. $(x + y + z)^2 - x^2$

Q17 Mathematics

68 is divided into three parts. When the first part is increased by 2, the second part is diminished by 2 and the third part is divided by 2, the resultant numbers all become equal. Find the value of the third part.

A. 68

B. 19

C. 15

D. 34 ✓

Q18 Mathematics HINDI - no English version saved

वनराज की आयु, उसके पुत्र की आयु की तीन गुनी है। उसकी पुत्री की आयु, उसके पुत्र की आयु से 3 वर्ष कम है। यदि 3 वर्ष पूर्व, इन तीनों की आयु का योग 63 वर्ष था, तो वनराज की वर्तमान आयु (वर्ष में) ज्ञात कीजिए।

A. 45 ✓

B. 36

C. 30

D. 42

Q19 Mathematics

15 articles are sold at the total cost price of 20 articles. The gain or loss per cent is:

A. $33\frac{1}{3}\%$ gain ✓

B. $33\frac{1}{3}\%$ loss

C. 20% gain

D. 20% loss



Q20 Mathematics

Due to decrease in manpower, the production in a factory decreases by 30%. By what per cent should the working hours be increased to restore the original production?

A. 41%

B. $42\frac{6}{7}\%$



C. 43%

D. 42%

Q21 Mathematics

Find the smallest natural number which, when divided by 9, 24 and 12, leaves a remainder 4 in each case but when divided by 5 leaves no remainder.

A. 150

B. 148

C. 220



D. 144

Q22 Mathematics

If the diagonals of a quadrilateral bisect each other at right angles, then the quadrilateral is a:

A. rectangle

B. parallelogram

C. rhombus



D. trapezium

Q23 Mathematics

Find the LCM of 550, 880 and 1320.

A. 10800

B. 12300

C. 13200



D. 11000



Q24 Mathematics

The ratio of the volumes of two cylinders A and B having the radii of their bases as 2 cm and 3 cm, respectively, and having the same height, is:

A. 4 : 9



B. 9 : 4

C. 2 : 3

D. 3 : 2

Q25 Mathematics

A train 400 m long travelling at a speed of 64 km/h crosses another train 720 m long moving in the opposite direction at a speed of 80 km/h. How much time does the second train take to cross a man sitting in the first train?

A. 12 sec

B. 15 sec

C. 16 sec

D. 18 sec



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Find the value of $5432.5678 + 435.692 + 29.54 + 6.3 + 0.4321$.

A. 5904.5319 ✓

B. 6004.5319

C. 5900.5329

D. 5904.5391

Q2 Mathematics

In a classroom, the number of boys and the number of girls are initially equal. 8 girls left to play ring tennis, leaving twice as many boys as girls in the classroom. The total number of girls and boys present initially were _____.

A. 26

B. 24

C. 34

D. 32 ✓

Q3 Mathematics

Lines $\vec{l} \parallel \vec{m} \parallel \vec{n}$ and $\vec{p}$, $\vec{q}$ are transversals of $\vec{l}$, $\vec{m}$ and $\vec{n}$.

$\vec{p}$ intersects lines $\vec{l}$, $\vec{m}$ and $\vec{n}$ at the points A, B and C respectively, while

$\vec{q}$ intersects lines $\vec{l}$, $\vec{m}$ and $\vec{n}$ at the points D, E and F respectively.

If $m(\overline{AB}) = m(\overline{DE})$, then which of the following is correct?

A. $m(\overline{BC}) = m(\overline{EF})$ ✓

B. $m(\overline{BD}) = m(\overline{CE})$

C. $m(\overline{CE}) = m(\overline{DF})$

D. $m(\overline{AD}) = m(\overline{DF})$



Q4 Mathematics

A certain sum invested at 12% simple interest per annum after 5 years yields an interest of ₹19,200. What is the sum invested?

A. ₹38,000

B. ₹32,000



C. ₹30,000

D. ₹28,000

Q5 Mathematics

The value of $\left(\frac{1}{\sec^2 \theta - \cos^2 \theta} + \frac{1}{\operatorname{cosec}^2 \theta - \sin^2 \theta}\right) (\sin^2 \theta \cos^2 \theta)$

A. $\frac{1 - \cos^2 \theta \sin^2 \theta}{2 + \cos^2 \theta \sin^2 \theta}$



B. $\frac{1 + \cos^2 \theta \sin^2 \theta}{2 - \cos^2 \theta \sin^2 \theta}$

C. $\frac{1 + \cos^2 \theta \sin^2 \theta}{2 + \cos^2 \theta \sin^2 \theta}$

D. $\frac{1 - \cos^2 \theta \sin^2 \theta}{2 - \cos^2 \theta \sin^2 \theta}$

Q6 Mathematics

If the 15 - digit number 4a5124356789734 is divisible by 9, then the value of "a" is _____.

A. 4



B. 3

C. 1

D. 5



Q7 Mathematics

In triangle ABC, P, Q, and R are the mid points of its sides BC, CA, and AB, respectively. If the area of triangle PQR is 6 cm^2 , then the area of triangle ABC is:

- A. 36 cm^2
- B. 12 cm^2
- C. 18 cm^2
- D. 24 cm^2 ✓

Q8 Mathematics

The number of natural numbers between 18 and 78, both excluded, which are divisible by 6 is _____.

- A. 10
- B. 9 ✓
- C. 11
- D. 12

Q9 Mathematics

Simplify $(7x - 1)^3 + (7x + 1)^3$.

- A. $686x^3 + 42x$ ✓
- B. $686x^3 - 42x$
- C. $-686x^3 + 42x$
- D. $-686x^3 - 42x$

Q10 Mathematics

A sphere and a cube have the same surface area. The ratio of the volume of the sphere to that of the cube is:

- A. $\sqrt{\pi} : \sqrt{6}$
- B. $\sqrt{6} : \sqrt{\pi}$ ✓
- C. $4\sqrt{3} : \sqrt{\pi}$
- D. $\sqrt{\pi} : 4\sqrt{3}$



Q11 Mathematics

Determine the positive value of 'k' for which the equations $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots.

A. 15

B. 14

C. 16



D. 17

Q12 Mathematics

The ages of a father and his son together add up to 80 years. If the age of the son be doubled, it will exceed the father's age by 10 years. Find the present age of the son.

A. 35 years

B. 40 years

C. 50 years

D. 30 years

**Q13** Mathematics

Find the median of the following distribution.

x	1	2	3	4	5
f	5	7	4	8	2

A. 13

B. 3



C. 4

D. 14



Q14 Mathematics

$$\sqrt{\frac{\sqrt{211600} + \sqrt{400}}{48000}} \text{ equals:}$$

A. $\frac{1}{4}$

B. $\frac{1}{10}$ ✓

C. $\frac{1}{12}$

D. $\frac{1}{48}$

Q15 Mathematics

Simplify the given expression.

$$\frac{140 \times 140 + 280 \times 450 \div 3 + 150 \times 150}{290}$$

A. 280

B. 270

C. 290 ✓

D. 275

Q16 Mathematics

What will ₹80,000 amount to in one year at 12% per annum, if the interest is compounded half-yearly?

A. ₹89,888 ✓

B. ₹1,00,352

C. ₹92,450

D. ₹88,888

Q17 Mathematics

If $2.5 : x :: x : 4.9$, and $x > 0$, find the value of x .

A. 3.5 ✓

B. 3.4

C. 3.3

D. 3.2



Q18 Mathematics

The sum of the roots of the equation $x^2 + 3a^2 = 4ax$ is:

A. $3a$

B. $4a$



C. $2a$

D. a

Q19 Mathematics

The total cost price of 63 identical articles is equal to the total selling price of 54 of those articles. What is the gain or loss percentage?

A. $16\frac{2}{3}\%$ loss

B. $16\frac{2}{3}\%$ gain



C. $15\frac{1}{3}\%$ loss

D. $15\frac{1}{3}\%$ gain

Q20 Mathematics

A person spends 84% of his income and saves the remaining amount. If he saves ₹8,000 per month, what is his monthly income?

A. ₹54,000

B. ₹45,000

C. ₹48,000

D. ₹50,000



Q21 Mathematics

The mean weight of 18 jackfruits is 7.2 kg. If the weights of 2 more jackfruits whose weights are equal are added, the mean weight decreases by 20 g. What is the weight of each jackfruit added later?

A. 7.18 kg

B. 7.22 kg

C. 7.00 kg



D. 7.40 kg

Q22 Mathematics

Find the SP of an article whose marked price is ₹4,500 and discount allowed is 4.2%.

A. ₹4,441.00

B. ₹4,311.00



C. ₹4,111.00

D. ₹4,213.45

Q23 Mathematics

The curved surface area of a sphere is 1386 cm^2 . Find the volume of the sphere. [Use $\pi = \frac{22}{7}$]

A. 2722 cm^3

B. 4158 cm^3

C. 4851 cm^3



D. 5572 cm^3

Q24 Mathematics

The cost of a keyboard and a mouse is ₹3,600. If the cost of the keyboard is seven times that of the mouse, what is the cost of the keyboard?

A. ₹3,050

B. ₹3,150



C. ₹450

D. ₹600



Q25 Mathematics

A and B can complete a piece of work in 20 days, B and C can complete the same piece of work in 12 days, while C and A can do it in 15 days. In how many days can A, B, and C together complete the same work?

A. 10



B. 15

C. 5

D. 12



Mathematics

25 Questions • Answer Key

Q1 Mathematics

In quadrilateral ABCD, we have $AD = 9$ cm, $BC = 8$ cm and $CD = 17$ cm, $AD \perp AB$ and diagonal $BD \perp BC$. Find the area of the quadrilateral ABCD.

A. 110 cm^2 B. 114 cm^2 ✓C. 112 cm^2 D. 111 cm^2

Q2 Mathematics

Find the median of the following data.

12, 16, 26, 15, 17, 18, 73, 74, 25, 24

A. 17

B. 18

C. 19

D. 21 ✓

Q3 Mathematics

If -2 is a root of the equation $3x^2 + px + 2 = 0$, and $7x^2 + px + k = 0$ has equal roots, then what is the value of k ?

A. $\frac{7}{2}$ B. $\frac{7}{4}$ ✓C. $\frac{2}{3}$ D. $\frac{4}{3}$ 

Q4 Mathematics

A sum of ₹2500 is invested in a bank at 6% interest per annum compounded annually. On maturity, the amount payable becomes ₹2809. Find the time period of the investment.

- A. 1 year
- B. 2.5 years
- C. 2 years
- D. 1.5 years

**Q5 Mathematics**

Ravi spends 20% of his income on petrol, one-third of the remaining income on household expenditure, and the balance is his savings. If he spends ₹7,500 on petrol, find his household expenditure.

- A. ₹8,500
- B. ₹8,566.70
- C. ₹8,666.70
- D. ₹10,000

**Q6 Mathematics**

Which of the numbers given below is a prime number?

- A. 983
- B. 986
- C. 153
- D. 319

**Q7 Mathematics**

Riya has a total of 60 pens and pencils. If she has 25 more pens and 5 less pencils, then the number of pens becomes three times the number of pencils. What is the difference between the number of pens and pencils that she had originally?

- A. 10
- B. 25
- C. 30
- D. 5



Q8 Mathematics

If 60% of $A = 1.2$ of $B = \frac{2}{5}$ of C , then find $A : B : C$.

A. 3 : 2 : 1

B. 3 : 1 : 2

C. 2 : 1 : 3



D. 1 : 2 : 3

Q9 Mathematics

Find the median of the data whose mean is 46 and mode is 45, using empirical relation (Round the answer off to one decimal place).

A. 45.5

B. 45.7



C. 45.9

D. 45.1

Q10 Mathematics

A house and a garden together cost ₹51 lakh and the cost of the garden is $\frac{5}{12}$ of the cost of the house. Find the cost of the garden (in ₹).

A. 30 lakh

B. 16 lakh

C. 15 lakh



D. 36 lakh

Q11 Mathematics

Three angles of $\triangle ABC$ are in the ratio 3 : 4 : 5, taken in order. If side AB is extended to X, what is the measure of exterior angle $\angle CBX$?

A. 120°



B. 100°

C. 80°

D. 60°



Q12 Mathematics

Given $a \sin q = b \cos q$ and $a \sin^3 q + b \cos^3 q = \sin q \cos q$, for $0 < q < 90^\circ$, find the value of $a^2 + b^2$.

A. 1



B. 2

C. 0

D. 3

Q13 Mathematics

3 right circular cylinders having the same base radius (r cm) and the same height (h cm) are placed one upon the other, to form another right cylinder whose radius of base is also r cm. The total surface area (in cm^2) of this new right cylindrical solid so formed is:

A. $6\pi rh + 2\pi r^2$ B. $6\pi rh + 6\pi r^2$ C. $4\pi rh + 4\pi r^2$ D. $6\pi rh + 4\pi r^2$ **Q14** Mathematics

If $7(x) + 5$, $7(x) + 4$, $5(x) + 5$ and y are in proportion when $x = 5$, find the value of y .

A. 29

B. 29.25



C. 29.5

D. 29.75

Q15 Mathematics

If the roots of the quadratic equation $x^2 - kx + 169 = 0$ are equal, find the value of k .

A. ± 13 B. ± 26 C. ± 17 D. ± 14 

Q16 Mathematics

$$\frac{9^4 \times 10^3 \times 4^{-4} \times 16^{\frac{1}{2}}}{5^6 \times 3^6} \text{ equals:}$$

A. $\frac{1}{9000}$

B. $\frac{1}{4000}$

C. $\frac{4}{9000}$

D. $\frac{9}{1000}$ ✓

Q17 Mathematics

If $0.3\overline{72} = \frac{x}{y}$, where x and y are coprime, then what is the value of $(x + y)$?

A. 134

B. 143

C. 151 ✓

D. 186

Q18 Mathematics

Three bells A, B and C toll every 15 seconds, 24 seconds, and 42 seconds, respectively. If all of them toll together at 8 a.m., then between 8 a.m. and 10 a.m. on the same day, how many times will they all toll together, including the one at 8 a.m.?

A. 6

B. 7

C. 8

D. 9 ✓



Q19 Mathematics

Expand $\left(\frac{1}{2}x + 3y - \frac{1}{3}z\right)^2$.

A. $\frac{1}{4}x^2 + 9y^2 + \frac{1}{9}z^2 + 3xy - 2yz - \frac{xz}{3}$ ✓

B. $\frac{1}{4}x^2 + 9y^2 - \frac{1}{9}z^2 + 3xy - 2yz - \frac{xz}{3}$

C. $\frac{1}{4}x^2 + 9y^2 + \frac{1}{9}z^2 - 3xy + 2yz + \frac{xz}{3}$

D. $\frac{1}{4}x^2 + 9y^2 - \frac{1}{9}z^2 - 3xy - 2yz - \frac{xz}{3}$

Q20 Mathematics

If $\triangle XYZ \cong \triangle ABC$, which of the following is necessarily correct?

A. $m(\overline{XY}) = m(\overline{AC})$

B. $m(\overline{XZ}) = m(\overline{BC})$

C. $m(\overline{YZ}) = m(\overline{AB})$

D. $m(\overline{XZ}) = m(\overline{AC})$ ✓

Q21 Mathematics

A, B and C can complete a piece of work in 18 days, 24 days and 60 days, respectively. In how many days will the work be completed, if A works on all days, and is assisted by B and C on alternate days, starting with B assisting A on the first day?

A. $11\frac{5}{13}$

B. $11\frac{10}{13}$ ✓

C. $12\frac{1}{9}$

D. $11\frac{11}{42}$



Q22 Mathematics

X sells a washing machine to Y at a profit of 20%. Y sells it to Z at a loss of 12% and later Z sells it to T at a profit of 30%. If Z earns ₹87.60 more than X as profit, then at what price (in ₹) did Y buy the washing machine?

A. 1,020

B. 980

C. 960

D. 900 ☒**Q23** Mathematics

The value of $\frac{[(34.45)]^2 - (11.75)^2 \times 5.15}{[(25.75)^2 + (25.75 \times 20.45)] \times 22.7}$ is:

A. $\frac{1}{10}$ B. $\frac{1}{5}$ ☒C. $\frac{2}{3}$ D. $\frac{1}{2}$ **Q24** Mathematics

Namita completes $33\frac{1}{3}\%$ of a piece of work alone in 16 days and the remaining work is completed by Bobby alone. The entire work is completed in a total of 28 days. Working together, Namita and Bobby can complete $\frac{11}{16}$ part of the original work in:

A. 6 days

B. 8 days

C. 9 days ☒

D. 12 days



Q25 Mathematics

The sum of the ages of three persons is 44 years and the numerical product of their ages is 1950. Also, the difference in the ages of the second and the third person, when subtracted from the difference in the ages of the first and the second person, is 5 years. Find the present age of the second person.

A. 25 years

B. 6 years

C. 13 years



D. 10 years



Mathematics

25 Questions • Answer Key

Q1 Mathematics

In a seminar, the number of participants in subjects A, B and C are 96, 160 and 224, respectively. Find the minimum number of rooms required, if in each room the same number of participants are seated and all participants in a room are from the same subject.

A. 12

B. 15



C. 24

D. 32

Q2 Mathematics

The sum of the interior angles of a quadrilateral is equal to:

A. 180° B. 360° C. 270° D. 390°

Q3 Mathematics

If the cost price of an article is ₹800 and if a 15% loss is incurred on selling the article, find the selling price.

A. ₹760

B. ₹780

C. ₹680



D. ₹860

Q4 Mathematics

2250 m of wire is used to fence a rectangular plot in three rounds. The length of the plot exceeds the breadth by 5 m. What is the length of the plot?

A. 215 m

B. 210 m

C. 185 m

D. 190 m



Q5 Mathematics

A boat goes 30 km upstream and 44 km downstream in a total of 10 hours. It also goes 40 km upstream and 55 km downstream in a total of 13 hours. The speed of the stream is:

A. 3 km/h



B. 5 km/h

C. 2 km/h

D. 4 km/h

Q6 Mathematics

$\left[\{(54.36 \times 0.4) + 0.256\} \div \sqrt{121} \right]$ equals:

A. 22

B. 11

C. 2



D. 1

Q7 Mathematics

A sells an article to B at a gain of 16%. B sells it to C at a loss of 15% and C sells it to D at a gain of 20%. If the difference between the profits earned by C and A is ₹248, then the loss (in ₹) incurred by B is:

A. 1,040

B. 1,150

C. 1,160



D. 1,200

Q8 Mathematics

AD and BC are two poles, that are respectively 30 metres and 15 metres tall, and both stand upright in a playground. A and B, respectively the feet of the two poles AD and BC, are 36 metres apart and $\overline{CE} \perp \overline{BA}$, intersecting $\overline{AD}$ at E. Find the ratio of the area of $\triangle DEC$ to the area of the rectangle ABCE.

A. 2 : 1

B. 1 : 2



C. 3 : 1

D. 1 : 3



Q9 Mathematics

The given table shows the number of people of various age groups visiting a park in a locality. Find the modal age (in years) of the visitors (rounded off to one decimal place).

Age (years)	Number of persons
0 - 10	4
10 - 20	14
20 - 30	18
30 - 40	23
40 - 50	27
50 - 60	16
60 - 70	8

A. 43.7

B. 47.2

C. 42.7



D. 42.1

Q10 Mathematics

$9(x)$, $x + 6$, $7(x) - 3$ and y are in proportion when $x = 3$. Find the value of y .

A. 54

B. 45

C. 6



D. 63

Q11 Mathematics

John has a cuboidal box whose length, breadth and height are in the ratio $2 : 3 : 5$. If the length, the breadth and the height of this box are each increased by 100% to make a new box, then the volume of the new box is how many times the volume of the old box?

A. 8 times



B. 7 times

C. 9 times

D. 6 times



Q12 Mathematics

44, 96 and 184, when divided by a number x , leaves the same remainder in each case. The largest value of x is:

A. 3

B. 4

C. 6

D. 8

Q13 Mathematics

Ram's salary increased by 12% and then decreased by 8%. Find the overall percentage change in his salary.

A. 3.04% increase

B. 3.04% decrease

C. 3.4% decrease

D. 3.4% increase

Q14 Mathematics

Simplify $(x + 2)(2x + 5)(x - 4) + x^2 + 5x - 12$.

A. $x^3 + 2x^2 - 21x - 52$ B. $2x^3 + 2x^2 - 21x - 52$ C. $2x^3 + x^2 - 21x - 52$ D. $2x^3 + 2x^2 - 21x - 12$ **Q15** Mathematics

If a sum of ₹80,000 is invested for a year at 4% per annum compounded half yearly, then find the compound interest.

A. ₹3,232

B. ₹2,323

C. ₹5,252

D. ₹2,525

Q16 Mathematics

The value of $(1 + \cot^2 \theta)(1 + \cos \theta)(1 - \cos \theta) + (1 - \sin \theta)(1 + \sin \theta)(1 + \tan^2 \theta)$ is:

A. 4

B. 1

C. 0

D. 2

**Q17** Mathematics

A man travelled the first 200 km at a speed of 50 km/h, the next 300 km at a speed of x km/h and the final 280 km at a speed of 80 km/h. If his average speed for the whole journey is 52 km/h, then the value of x is:

A. 36

B. 40

C. 42

D. 45

**Q18** Mathematics

The data below gives the number of wickets taken by a bowler in 10 different matches. Find the mode of the data.

3, 4, 6, 3, 1, 3, 5, 4, 2, 2.

A. 2

B. 3

C. 4

D. 6

**Q19** Mathematics

Find the roots of the quadratic equation $x^2 + 30x + 104 = 0$

A. 14, 16

B. 12, 18

C. 4, 26

D. -4, -26



Q20 Mathematics

Express $4.\overline{142}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{4136}{999}$

B. $\frac{4138}{999}$ ✓

C. $\frac{4140}{999}$

D. $\frac{4142}{999}$

Q21 Mathematics

The sum of three consecutive numbers is 177. The mean of these three numbers is:

A. 58

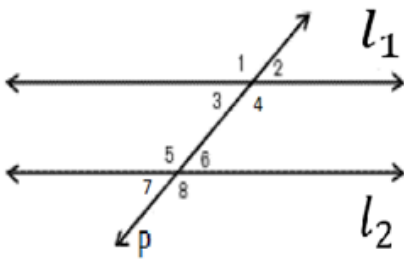
B. 59 ✓

C. 60

D. 57

Q22 Mathematics

In the given figure, $l_1 \parallel l_2$ and p is their transversal with angle $4 = 5x+35$ and angle $7 = 45^\circ$. Find the value of x.



A. 10°

B. 20° ✓

C. 40°

D. 45°



Q23 Mathematics

If $0.72\overline{45} = \frac{a}{b}$, where the HCF of a and b is 1, then what is the value of (b – a)?

A. 113

B. 313

C. 303



D. 606

Q24 Mathematics

An electric pump can fill a tank in 5 hours. Due to a leakage in the tank, it takes $7\frac{1}{2}$ hours to fill the tank. How much time will this leak take to empty the full tank if water does not get in or out of the tank through any other point during this period?

A. 30 hours

B. 25 hours

C. 20 hours

D. 15 hours

**Q25** Mathematics

If α and β are the roots of the equation $2x^2 - 3x - 5 = 0$, then the quadratic equation whose roots are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is:

A. $10x^2 - 29x - 10 = 0$

B. $10x^2 - 29x + 10 = 0$

C. $10x^2 + 29x - 10 = 0$

D. $10x^2 + 29x + 10 = 0$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Simplify $(3x + 4)^2 + (3x - 4)^2 + (3x + 4)(3x - 4)$.

A. $27x^2 + 48x + 32$

B. $27x^2 - 24x + 16$

C. $27x^2 + 16$ ✓

D. $27x^2 - 16$

Q2 Mathematics

Find the median of the given frequency distribution.

Class Interval	0-10	10-20	20-30	30-40	40-50
f	8	7	9	12	11

A. $\frac{215}{9}$

B. $\frac{265}{9}$ ✓

C. $\frac{85}{3}$

D. $\frac{88}{3}$

Q3 Mathematics

A can complete a piece of work alone in 10 days and B can complete the same piece of work alone in 15 days. Working together, A, B and C can complete this work in $4\frac{1}{2}$ days. If B does not work, while A and C work on alternate days, starting with C, then in how many days will the work be completed?

A. $13\frac{1}{9}$ ✓

B. 13

C. $13\frac{1}{5}$

D. $12\frac{2}{3}$



Q4 Mathematics

The selling price of a sewing machine is ₹19,440. If it was sold at 8% profit, find its cost price.

A. ₹18,000.00



B. ₹16,000.00

C. ₹17,595.20

D. ₹20,559.20

Q5 Mathematics

A solid right cylinder having a base of diameter 10 cm and height 2 cm is melted and recast into right cylindrical coins with a base diameter of 1 cm and a 0.2 cm thickness. Find the number of coins that can be made.

A. 1000



B. 100

C. 10,000

D. 1001

Q6 Mathematics

Find the single percentage discount equivalent to three successive discounts of 30%, 20% and 10% respectively.

A. 50.4%

B. 49.6%



C. 46.4%

D. 64.6%

Q7 Mathematics

Rani is elder to Rosy by 1 year, and Rosy is elder to Rimmy by 1 year. The sum of their ages is 48 years. What is Rosy's age?

A. 15 years

B. 16 years



C. 17 years

D. 21 years



Q8 Mathematics

The diameter of a wheel is 63 cm. What is the distance covered by the wheel by making 100 revolutions? [Use $\pi = \frac{22}{7}$]

A. 99 m

B. 198 m



C. 28 m

D. 396 m

Q9 Mathematics

If the median and the mode of a set of data are 12 and 15, respectively, then find the value of thrice the mean of the same data set.

A. $\frac{35}{2}$

B. $\frac{63}{2}$



C. $\frac{33}{2}$

D. $\frac{23}{2}$

Q10 Mathematics

In a triangle ABC, which of the following statements is correct?

A. Side AB + Side BC > Side AC



B. Side AB + Side BC = Side AC

C. Side AB + Side BC < Side AC

D. Side AB + Side BC $\geq$ Side AC



Q11 Mathematics

The value of $\frac{[(0.68)^2 + (0.32)^2 + 16 \times 0.0136]}{[(0.68)^3 - (0.32)^3] \div (0.3)^2}$ is:

A. $\frac{1}{4}$



B. $\frac{1}{2}$

C. $\frac{3}{8}$

D. $\frac{3}{5}$

Q12 Mathematics

A sum of ₹10,000 amounts to ₹11,025 in 2 years at a certain rate of interest per annum, compounded annually. The rate of interest per annum is:

A. 6%

B. 4%

C. 3%

D. 5%



Q13 Mathematics

If $0.0\overline{216}$ is written as a fraction in lowest terms, then what is the difference between the denominator and the numerator of the fraction?

A. 179

B. 181



C. 183

D. 187

Q14 Mathematics

$\left[\left\{ (9261)^{\frac{1}{3}} \div 81^{\frac{1}{4}} \right\}^2 \times \sqrt[4]{1296} \right]$ equals:

A. 249

B. 147

C. 294

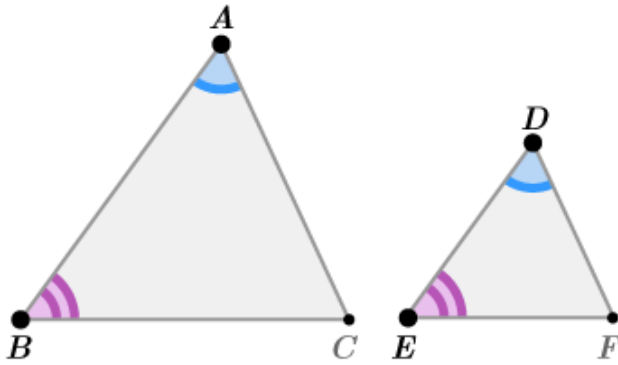


D. 174



Q15 Mathematics

In the given figure, $\triangle ABC$ is similar to $\triangle DEF$; if $AB = 6.5$ cm, $DE = 3.9$ cm, and $BC = 5.15$ cm, find EF .



A. 3.09 cm



B. 3.00 cm

C. 3.90 cm

D. 4.12 cm

Q16 Mathematics

The LCM and the HCF of two numbers are 5005 and 77, respectively. When one of the two numbers is divided by 55, the quotient is 18 and the remainder is 11. The other number is:

A. 330

B. 385



C. 418

D. 440

Q17 Mathematics

Find the sum of the roots of the quadratic equation $x^2 + 19x + 60 = 0$.

A. $1/19$

B. -19



C. 19

D. $-19/60$



Q18 Mathematics

Initially Ram had ₹4 with him and Shyam had ₹7 with him. Jatin gave each of Ram and Shyam an equal amount of money and after that the amounts Ram and Shyam had were in the ratio 7 : 9. How much money (in ₹) did Jatin give to each of Ram and Shyam?

A. 5.50

B. 6.00

C. 6.50 ✓

D. 7.00

Q19 Mathematics

A can complete $33\frac{1}{3}\%$ of a piece of work in 10 days and B can complete one-fourth of the same work in 30 days. A, B and C together can complete the same work in 12 days. In how many days will the work be completed if A works on all days, and is assisted by B and C on alternate days, starting with B assisting A on the first day?

A. $18\frac{2}{3}$

B. $18\frac{4}{13}$

C. $17\frac{1}{3}$ ✓

D. $17\frac{3}{13}$

Q20 Mathematics

Which of the following represents a quadratic equation?

A. $(x + 3)(x - 4) = x^2 + 2x + 12$

B. $(x + 2)(x + 2)(x - 1) = x^3 + 5x^2 + 6x + 4$ ✓

C. $(3x + 4)x = 3x^2 + 16$

D. $(x - 7)(x + 2) = (x - 2)(x)$

Q21 Mathematics

$\sin^6 \theta + \cos^6 \theta$ can be simplified as:

A. $1 - \sin^2 \theta \cos^2 \theta$

B. $1 + 3 \sin^2 \theta \cos^2 \theta$

C. $1 + \sin^2 \theta \cos^2 \theta$

D. $1 - 3 \sin^2 \theta \cos^2 \theta$ ✓



Q22 Mathematics

Which of the options below gives a pair of co-prime numbers?

A. (196, 343)

B. (156, 234)

C. (228, 247)

D. (161, 192)

**Q23** Mathematics

Ten years later, Ramesh will be twice as old as Rajiv and five years ago Ramesh was three times as old as Rajiv. Find the present age (in years) of Ramesh.

A. 50



B. 20

C. 40

D. 60

Q24 Mathematics

If $\left(\frac{32}{243}\right)^k = \frac{8}{27}$, then $k =$ _____.

A. $\frac{2}{3}$

B. $\frac{3}{5}$



C. $\frac{5}{3}$

D. $\frac{3}{2}$

Q25 Mathematics

The ratio of A's salary to B's salary is 4 : 5. The ratio of B's salary to C's salary is 3 : 4. Find the ratio of A's salary to C's salary.

A. 4 : 3

B. 5 : 4

C. 3 : 5



D. 4 : 5



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Shalini's age is four times the sum of the ages of her two sons. Six years hence, her age will be double the sum of their ages. What is Shalini's present age?

A. 36 years



B. 26 years

C. 32 years

D. 40 years

Q2 Mathematics

A quadratic equation whose roots are $\frac{5}{3}$ and $-\frac{3}{4}$ is:

A. $6x^2 - 11x - 15 = 0$ B. $6x^2 + 11x - 15 = 0$ C. $12x^2 - 11x - 15 = 0$ D. $12x^2 + 22x - 15 = 0$

Q3 Mathematics

If $p \sin^2 \beta + q \cos^2 \beta = r$, then the value of $\cot^2 \beta$ is:

A. $\frac{r - p}{r - q}$ B. $\frac{p - r}{r - q}$ C. $\frac{r - q}{p - r}$ D. $\frac{r - q}{r - p}$ 

Q4 Mathematics

The value of $\frac{(0.42)^2 + 36(0.05)^2}{9(0.21)^2 + (0.45)^2}$ is:

A. $\frac{2}{9}$

B. $\frac{2}{3}$

C. $\frac{4}{9}$



D. $\frac{5}{18}$

Q5 Mathematics

Aditya can complete a piece of work alone in 8 days and Bhagawan can complete the same piece of work alone in 12 days. They started the work together, but Aditya had to leave 3 days before the completion of the work. In how many days will the work complete?

A. $6\frac{2}{5}$ days

B. $6\frac{4}{5}$ days

C. $6\frac{3}{5}$ days



D. $6\frac{1}{5}$ days

Q6 Mathematics

If $x = (\sqrt{2352} \div \sqrt{1200}) \div \sqrt{0.04}$, then the value of $\frac{x+1}{x-1}$ is:

A. $\frac{3}{2}$

B. $\frac{3}{4}$

C. $\frac{2}{3}$

D. $\frac{4}{3}$



Q7 Mathematics

The ratio of boys and girls in a school that has 480 students is 7 : 9. What will be the ratio of boys and girls if 3 more girls are admitted to the school?

A. 10 : 13



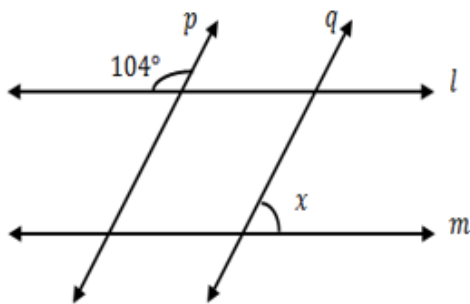
B. 13 : 10

C. 7 : 9

D. 9 : 7

Q8 Mathematics

In the given figure, $l \parallel m$ and $p \parallel q$. The value of x is:



A. 76°



B. 82°

C. 96°

D. 104°

Q9 Mathematics

After two successive discounts, a tie with a list price of ₹120 is available at ₹90. If the second discount is 9%, what is the first discount percentage? [Give your answer correct to 2 places of decimal.]

A. 84.42%

B. 17.58%



C. 63.33%

D. 71.58%



Q10 Mathematics

If $100 : 250 :: 250 : x$, then what is the value of x ?

A. 625



B. 6.25

C. 250

D. 25

Q11 Mathematics

Find the single percentage discount equivalent to three successive discounts of 30%, 20% and 10%.

A. 49.6%



B. 50.4%

C. 60%

D. 46.9%

Q12 Mathematics

Find the average of 12, 15, 16, 17, 23 and 19.

A. 13

B. 15

C. 17



D. 18

Q13 Mathematics

If a sum of ₹2,000 amounts to ₹2,360 in 3 years at a certain rate of simple interest per annum, then what will the same sum amount to in 5 years, if the rate of simple interest per annum remains the same?

A. ₹2,500

B. ₹2,600



C. ₹2,650

D. ₹2,605



Q14 Mathematics

If $0.25a = 0.05b$, then which of the options below gives the best approximation of the value of $\frac{b-a}{b+a}$?

A. 0.16

B. 1.6

C. 0.67



D. 6.6

Q15 Mathematics

Find the missing value of weight (x) assigned if the weighted average of the data set provided below is 24.5.

Object	A	B	C	D
Value of object	15	2	30	43
Assigned weight	3	2	x	1

A. 4

B. 10



C. 5

D. 12

Q16 Mathematics

The 6-digit number 473 xy 5 is divisible by 125. How many such 6-digit numbers are there?

A. 1

B. 2

C. 3

D. 4

**Q17** Mathematics

Rashmika had to travel 612 km in a car travelling at a certain speed. If she reached her destination in 9 hours, find the speed of the car.

A. 60 km/h

B. 65 km/h

C. 68 km/h



D. 70 km/h



Q18 Mathematics

Three numbers are in the ratio 3 : 5 : 7 and their LCM is 5250. What is the middle number?

- A. 200
- B. 150
- C. 350
- D. 250



Q19 Mathematics

If 2 is a root of the equation $x^2 - px + 6 = 0$ and the quadratic equation $x^2 + 2px + q = 0$ has equal roots, then the value of q is:

- A. 12
- B. 16
- C. 25
- D. 36



Q20 Mathematics

If one-third of a number is 6 more than the number itself, then find the number.

- A. -7
- B. -9
- C. -6
- D. -5



Q21 Mathematics

The surface area of a 12 cm × 6 cm × 4 cm brick is:

- A. 274 cm²
- B. 288 cm²
- C. 296 cm²
- D. 312 cm²



Q22 Mathematics

What is the area of a regular hexagon the length of each of whose sides is 4 cm?

A. $24\sqrt{3} \text{ cm}^2$



B. $25\sqrt{3} \text{ cm}^2$

C. $26\sqrt{3} \text{ cm}^2$

D. $27\sqrt{3} \text{ cm}^2$

Q23 Mathematics

The measure of $\angle OQR = 48^\circ$. Point V lies on OQ, $VT \parallel QR$ and S is a point in the interior of $\angle OQR$ such that V, S and T are collinear and S lies in between V and T. P is also a point on OQ, such that P lies in between O and V, and $m\angle PST = 120^\circ$. What is the measure of the complement of $\angle QPS$?

A. 18°



B. 22°

C. 28°

D. 32°

Q24 Mathematics

Simplify the given expression.

$$4\left(\frac{3}{2}x^2 - 4x + 3\right) - \frac{1}{2}(4x^2 + 8x - 18)$$

A. $4x^2 - 20x + 21$



B. $4x^2 - 20x - 21$

C. $4x^2 + 20x - 21$

D. $4x^2 + 20x + 21$



Simplify the given expression.

$$(x^2 + xy + y^2)^2 - (x^2 - xy + y^2)^2$$

A. $4xy(x^2 + y^2)$



B. $2xy(x^2 + y^2)$

C. $4xy(x^2 - y^2)$

D. $2xy(x^2 - y^2)$



Mathematics

25 Questions · Answer Key

Q1 Mathematics

Simplify the following.

$$0.\overline{06} \times 8.\overline{3}$$

A. $0.0\overline{50}$

B. $0.0\overline{50}$

C. $0.5\overline{0}$ ✓

D. $0.1\overline{50}$

Q2 Mathematics

The nominal marks obtained by students who appeared in a test are given below. Find the median marks of the students.

Marks	11	20	8	16	29	22
No. of students	14	5	11	9	3	8

A. 8

B. 10.5

C. 13.5 ✓

D. 13

Q3 Mathematics

The value of $(\sin \theta + \operatorname{cosec} \theta)^2 + (\cos \theta + \sec \theta)^2$ is:

A. $5 - \cot^2 \theta + \tan^2 \theta$

B. $5 + \cot^2 \theta + \tan^2 \theta$

C. $7 - \cot^2 \theta + \tan^2 \theta$

D. $7 + \cot^2 \theta + \tan^2 \theta$ ✓



Q4 Mathematics

Simplify $\frac{(5p-q)^3 - (3p-2q)^3 - (q+2p)^3}{13pq - 15p^2 - 2q^2}$.

- A. $6p+3q$
- B. $-6p-3q$ ✓
- C. $6p-3q$
- D. $-6p+3q$

Q5 Mathematics

Simplify the given expression.

$$\frac{5}{2}x^2 + 4x + \frac{3}{2} + \frac{x^2}{2} - 6x + \frac{5}{2}$$

- A. $3x^2 + 2x - 4$
- B. $3x^2 - 2x + 4$ ✓
- C. $3x^2 + 2x + 4$
- D. $3x^2 - 2x - 4$

Q6 Mathematics

Six equal cubes, each of side 7 cm, are placed adjacent to each other. The volume of the new solid formed will be:

- A. 2058 cm^3 ✓
- B. 2124 cm^3
- C. 2206 cm^3
- D. 2312 cm^3

Q7 Mathematics

In what time will a sum of ₹6,400 amount to ₹7,168 at 6% simple interest per annum?

- A. 2.5 years
- B. 3 years
- C. 4 years
- D. 2 years ✓



Q8 Mathematics

Which of the following are exactly divisible by 44?

(a) 155232

(b) 155248

(c) 156944

(d) 156992

A. Only (a) and (c)

B. Only (b) and (c)

C. Only (b) and (d)

D. Only (a) and (d)



Q9 Mathematics

Simplify the given expression.

$$(\sqrt{1008} \div \sqrt{448}) \times \sqrt{0.16}$$

A. 0.6

B. 0.8

C. 0.3

D. 0.9



Q10 Mathematics

A dishonest shopkeeper promises to sell his goods at cost price. However, he uses a weight that actually weighs 40% less than what is written on it. Find his profit percentage.

A. $62\frac{2}{3}\%$

B. $65\frac{2}{3}\%$

C. $66\frac{2}{3}\%$

D. $66\frac{1}{3}\%$



Q11 Mathematics

Consider two numbers whose $\text{LCM} + \text{HCF} = 504$, and $\text{LCM} - \text{HCF} = 456$. If one of these two numbers is 96, find the other number.

- A. 126
- B. 130
- C. 100
- D. 120

**Q12** Mathematics

Ravi's age is 5 years more than Gowri's age. The sum of their ages is 31 years. What is Gowri's age?

- A. 13 years
- B. 18 years
- C. 15 years
- D. 16 years

**Q13** Mathematics

Express $0.\overline{12}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

- A. $\frac{4}{33}$
- B. $\frac{5}{33}$
- C. $\frac{6}{33}$
- D. $\frac{7}{33}$

**Q14** Mathematics

Chakravarty drives a car at a speed of 52 km/h. How much time will he take to cover a distance of 364 km?

- A. 4 hours
- B. 5 hours
- C. 6 hours
- D. 7 hours



Q15 Mathematics

Which of the following equations is NOT a quadratic equation?

A. $(2x + 1)(3x - 4) = 2x^2 + 3$

B. $x^2 + 2\sqrt{x} - 5 = 0$ ✓

C. $\sqrt{3} x^2 - 2x + \frac{1}{\sqrt{2}} = 0$

D. $(x + 2)^3 = x^3 - 5$

Q16 Mathematics

Two trains are running in opposite directions on parallel tracks. If their speeds are 50 km/h and 58 km/h, find their relative speed.

A. 20 m/s

B. 30 m/s ✓

C. 40 m/s

D. 50 m/s

Q17 Mathematics

From the salary of Hari, 15% is deducted as house rent, 20% of the remaining amount is spent on children's education, and 10% of the remaining balance is his medical expenses. Finally, he is left with ₹42,840. Find his total salary.

A. ₹65,000

B. ₹70,000 ✓

C. ₹75,000

D. ₹72,500

Q18 Mathematics

If the marked price of an article is ₹2,850 and the discount is 21%, then find the selling price.

A. ₹2,251.50 ✓

B. ₹2,521.50

C. ₹2,215.50

D. ₹2,259.50



Q19 Mathematics

Giri and Kamal invested their capitals in a business in the ratio 5 : 7, respectively. If ₹1,728 was the total money invested in the business, what is Giri's share in the business?

A. ₹1,008

B. ₹720



C. ₹702

D. ₹1,080

Q20 Mathematics

If the median of a set of data is 12 and its mean is 10, then find the mode of this data set, using the empirical formula.

A. 14

B. 16



C. 15

D. 17

Q21 Mathematics

If r and s are the roots of $x^2 - 3x + 2 = 0$, then the quadratic equation in x whose roots are $r^2 + s^2$ and $(rs)^2$ is:

A. $x^2 + 9x - 20 = 0$ B. $x^2 + 9x + 20 = 0$ C. $x^2 - 9x - 20 = 0$ D. $x^2 - 9x + 20 = 0$ **Q22** Mathematics

If the perimeter of a square is 44 cm, then find the perimeter of a circle whose radius is equal to the length of a side of the given square.

A. 22π B. 12π C. 21π D. 11π 

Q23 Mathematics

The length of a rectangular plot is 60% more than its breadth. If the difference between the length and the breadth of that rectangle is 30 cm, what is the perimeter of that rectangle?

- A. 330 cm
- B. 300 cm
- C. 270 cm
- D. 260 cm



Q24 Mathematics

A regular polygon in which each interior angle is 140° is a/an:

- A. heptagon
- B. octagon
- C. nonagon
- D. decagon



Q25 Mathematics

The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rhombus, if

- A. PQRS is a rhombus
- B. PQRS is a trapezium
- C. Diagonals of PQRS are equal
- D. Diagonals of PQRS are perpendicular



Mathematics

25 Questions • Answer Key

Q1 Mathematics

By selling an article for ₹940 a man incurs a loss of 6%. What is its cost price?

A. ₹1,250

B. ₹480

C. ₹960

D. ₹1,000



Q2 Mathematics

Find the arithmetic mean of the following data.

x	5	10	15	20	25	30
f	3	5	6	2	1	3

A. 12.5

B. 13.5

C. 14.5

D. 15.5



Q3 Mathematics

If $\tan q + \cot q = 14$, then find the value of $7\tan^2 q + 7\cot^2 q$.

A. 194

B. 1386

C. 1358

D. 198



Q4 Mathematics

A shopkeeper bought articles A and B for a total of ₹2,540. He sold A at a gain of 15% and sold B at a loss of 25%. The selling price of A was ₹109 more than that of B. His profit or loss percentage in the entire transaction is (correct to one decimal place):

- A. profit, 8.3%
- B. loss, 8.3%
- C. loss, 8.5%
- D. profit, 8.5%

**Q5 Mathematics**

Simplify the given expression.

$$(y - z)^3 + (z - x)^3 + (x - y)^3$$

- A. $(x - y)(y - z)(z - x)$
- B. $3(x - y)(y - z)(z + x)$
- C. $3(x - y)(y - z)(z - x)$
- D. $3(x - y)(y - z)(x - z)$

**Q6 Mathematics**

Ramu works in shop for ₹125 per hour. If his pay is increased to ₹145 per hour, find his percentage increase in pay.

- A. 12%
- B. 14%
- C. 16%
- D. 18%

**Q7 Mathematics**

Which of the following statements is NOT necessarily true?

- A. The diagonals of a rectangle bisect each other.
- B. The diagonals of a parallelogram bisect each other.
- C. The diagonals of a rhombus bisect each other.
- D. The diagonals of a kite bisect each other.



Q8 Mathematics

If $0.045 + 0.154 - 0.09 + 1.5 - (0.3 \times 0.8) = x - 0.231$, then the value of x lies between:

- A. 1.1 and 1.3
- B. 1.3 and 1.5
- C. 1.5 and 1.8
- D. 1.8 and 2.0

**Q9** Mathematics

If an investment earns a simple interest rate of 4% per annum, then how many years will it take for the investment to double itself?

- A. 10
- B. 20
- C. 25
- D. 15

**Q10** Mathematics

Express $3.\overline{31}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

- A. $\frac{109}{33}$
- B. $\frac{328}{99}$
- C. $\frac{329}{99}$
- D. $\frac{10}{3}$

**Q11** Mathematics

If the sum of two numbers is 48, while the HCF of these two numbers is 6, then the total number of such pairs of numbers (x, y) , where $x > y$, is:

- A. 4
- B. 3
- C. 2
- D. 1



Q12 Mathematics

The average score of a cricketer in his first 7 innings is 28 runs. His average score in the next 3 innings is 32 runs. Determine the score he should get in his 11th inning so that his overall average score becomes 33 runs.

A. 49

B. 50

C. 55

D. 71

**Q13** Mathematics

If $x = b + c$, $y = c - a$, $z = a - b$, then find the value of $x^2 + y^2 + z^2 - 2xy - 2xz + 2yz$.

A. $4c^2$ B. $4a^2$ C. $4b^2$ D. $2b$ **Q14** Mathematics

Find the area of a rhombus whose diagonals measure 24.6 cm and 28.6 cm, respectively.

A. 657.46 cm^2 B. 251.78 cm^2 C. 703.56 cm^2 D. 351.78 cm^2 **Q15** Mathematics

Which of the following represents a quadratic equation?

A. $5x^2 + 4x - 2 = 7x$ B. $(x + 7)4 = 14$ C. $3x + 7 = 7x^3$ D. $4x^2 + 6x + 5 = 4x(x + 1)$ 

Q16 Mathematics

Two pipes can fill a cistern, individually, in 60 min and 75 min, respectively. There is a pipe located at the bottom of the cistern to empty it. If all the three pipes are opened simultaneously, then the empty cistern gets filled in 50 min. How long will the pipe at the bottom of the tank take to empty the completely filled cistern if no other pipe is then open?

- A. 75 min
- B. 100 min
- C. 150 min
- D. 200 min

**Q17** Mathematics

The difference between the total surface area and the lateral surface area of a cube is 4050 units². Find the length of each side of the cube.

- A. 40 units
- B. 54 units
- C. 45 units
- D. 35 units

**Q18** Mathematics

Simplify the given expression.

$$[(x - y) + \frac{y^2}{x + y}] \div [x^2 + y^2 + \frac{y^4}{x^2 - y^2}] \times \frac{y^2}{x - y}$$

A. $\frac{x^2}{y^2}$

B. $\frac{y^2}{x^2}$

C. $\frac{x^2 - y^2}{x^2 y^2}$

D. $x^2 y^2$



Q19 Mathematics

The units digit of a 2-digit number is three times its tens digit. If the units digit is 6, what is the value of twice the number?

A. 26

B. 52



C. 24

D. 48

Q20 Mathematics

Let $x = 55^{100} + 55^{101} + 55^{102}$. Which of the following prime number is NOT a factor of x ?

A. 3

B. 11

C. 71



D. 79

Q21 Mathematics

Navya and Bhavya can paint a house in 20 days and 30 days, respectively. If they work on alternate days, starting with Bhavya, in how many days can the duo complete painting that house?

A. 40 days

B. 48 days

C. 24 days



D. 12 days

Q22 Mathematics

145 is divided into two parts, a and b , such that $a : b :: 2 : 3$. Also, $a : c :: c : b$ and $c > 0$. Find the value of c , correct to the nearest integer.

A. 61

B. 65

C. 71



D. 75



Q23 Mathematics

$[(324 \div 9) \div 4] \times 25 + 186$ equals:

A. 411



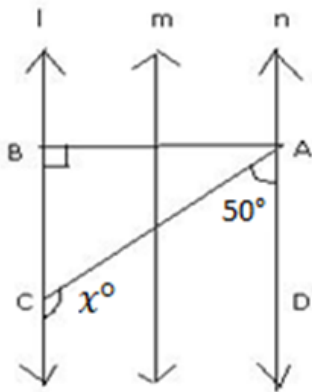
B. 114

C. 386

D. 141

Q24 Mathematics

In the given figure, l is parallel to m and m is parallel to n . Find the value of x° .



A. 30°

B. 50°

C. 100°

D. 130°



Q25 Mathematics

If $x = \frac{2}{3}$ is one of the solutions of the quadratic equation $7x^2 + kx - 3 = 0$, then the value of k satisfies the equation:

A. $6k^2 - 5k + 1 = 0$

B. $6k^2 - 3k - 1 = 0$

C. $12k^2 + 4k - 1 = 0$

D. $12k^2 - 4k - 1 = 0$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The sum of two consecutive even numbers is 842. What is the smaller number?

A. 421

B. 422

C. 420



D. 423

Q2 Mathematics

A cistern has a hole in the bottom through which the water is leaking. A tap can fill the cistern in 3 hours and the hole in the bottom can empty the fully filled cistern in 5 hours. If both the tap and the hole are open, then what will be the time taken to completely fill the empty cistern?

A. 7.5 hours



B. 7 hours

C. 8.5 hours

D. 6.5 hours

Q3 Mathematics

The following is a cumulative frequency distribution (less than type) of 900 persons, each of age 30 years and above. What is the modal age (in years) (correct to one decimal place)?

Age below (in years)	40	50	60	70	80
Number of persons	120	250	650	850	900

A. 54.5

B. 54.8

C. 55.2

D. 55.7



Q4 Mathematics

Simplify the given expression.

$$x^2 + 3x + 12 - 2(x^3 - x + 4)$$

A. $4 + 5x - x^2 - 2x^3$

B. $4 + 5x + x^2 + 2x^3$

C. $4 + 5x + x^2 - 2x^3$ ✓

D. $4 - 5x + x^2 - 2x^3$

Q5 Mathematics

Express $1.\bar{2}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{10}{9}$

B. $\frac{11}{9}$ ✓

C. $\frac{4}{3}$

D. $\frac{13}{9}$

Q6 Mathematics

A trader claims to sell rice at a profit of 25%, but also dishonestly uses a weight which is 15% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round the answer to the nearest whole number.)

A. 57%

B. 50%

C. 49%

D. 47% ✓

Q7 Mathematics

Raju's sister is 6 years older than Raju. If his sister's age is 38 years, then find Raju's age?

A. 28 years

B. 23 years

C. 32 years ✓

D. 30 years



Q8 Mathematics

If p and q are the roots of $x^2 + 4x - 21 = 0$ and $p < q$, then the quadratic equation in x whose roots are $(p - 1)$ and $(q + 1)$ is:

A. $x^2 + 4x + 32 = 0$

B. $x^2 + 4x - 32 = 0$ ✓

C. $x^2 + 6x + 16 = 0$

D. $x^2 + 6x - 16 = 0$

Q9 Mathematics

The height of a right circular cylinder is 23 cm and circumference of its base is 77 cm. What is its curved surface area?

A. 1771 cm^2 ✓

B. 1823 cm^2

C. 1979 cm^2

D. 2014 cm^2

Q10 Mathematics

On selling an article X at a loss of 10% and an article Y at a gain of 15%, a man gains ₹7. If he had sold article X at a gain of 12% and article Y at a gain of 5%, he would have gained ₹10. What is the total original cost price (in ₹) of X and Y?

A. 120

B. 125

C. 130 ✓

D. 140

Q11 Mathematics

If in a parallelogram ABCD, E and F are points on the diagonal AC such that $\overline{AE} = \overline{FC}$, then quadrilateral BEDF is a:

A. square

B. trapezium, but not a parallelogram

C. parallelogram ✓

D. rectangle



Q12 Mathematics

A person 1.75 m tall casts a 2 m shadow. At the same instance, a lamp-post casts a shadow of 6.4 m. The height of the lamp-post is:

A. 5.6 m



B. 5.7 m

C. 5.8 m

D. 5.9 m

Q13 Mathematics

If three metallic spheres of radii 3 cm, 4 cm and 5 cm respectively are melted to form a single sphere, then what will be the volume of the new sphere? [Use $\pi = \frac{22}{7}$]

A. $905\frac{1}{7} \text{ cm}^3$



B. $825\frac{2}{7} \text{ cm}^3$

C. $675\frac{3}{7} \text{ cm}^3$

D. $345\frac{5}{7} \text{ cm}^3$

Q14 Mathematics

100 eggs were purchased for ₹100. 12 eggs broke in transit. The trader sold the remaining eggs at ₹1.20 per egg. Find his profit.

A. ₹7.60

B. ₹17.60

C. ₹15.60

D. ₹5.60

**Q15** Mathematics

Find the median of the below data.

2, 6, 5, 2, 4, 9, 6, 2, 6, 4, 10, 12, 6, 3, 4, 9

A. 4.5

B. 6

C. 5

D. 5.5



Q16 Mathematics

Azim borrowed a certain sum which amounted to ₹19,800 in 36 months at 12.5% per annum simple interest. What is the borrowed sum?

A. ₹12,800

B. ₹14,400



C. ₹13,600

D. ₹9,600

Q17 Mathematics

If a and b are the roots of the equation $x^2 - 5x - 6 = 0$, then the value of $(a - b)^2$ is:

A. 25

B. 49



C. 24

D. 18

Q18 Mathematics

Two trains of equal length are running on parallel lines in the same direction at speeds of 36 km/h and 26 km/h. The faster train passes the slower train in 18 seconds. The length of each train is:

A. 75 metres

B. 70 metres

C. 50 metres

D. 25 metres



Q19 Mathematics

When a number is divided by 15, it leaves a remainder of 3. If the same number is divided by 17, the remainder is 11. Which of the options below gives such a number?

A. 183

B. 185

C. 190

D. 198



Q20 Mathematics

Simplify the following.

$$0.\overline{1} + 0.\overline{5}$$

A. $\frac{1}{90}$

B. $\frac{2}{3}$



C. $\frac{4}{9}$

D. $\frac{1}{9}$

Q21 Mathematics

Simplify the given expression.

$$\frac{\sqrt{2187} \times \sqrt{432}}{\sqrt{324}}$$

A. 42

B. 48

C. 54



D. 56

Q22 Mathematics

If α is an acute angle and $\tan^2 \alpha - \sec \alpha = 19$, then the value of $\cos \alpha$ is:

A. $\frac{2}{3}$

B. $\frac{1}{5}$



C. $\frac{1}{4}$

D. $\frac{1}{2}$



Q23 Mathematics

The simplest form of the ratio 722 : 1083 is:

A. 3 : 2

B. 2 : 3

C. 1 : 3

D. 3 : 5



Q24 Mathematics

The population of a city increased by 10% in 2020 and then decreased by 8% in 2021. Find the percentage change in the population of the city at the end of 2021 with respect to its population at the beginning of 2020.

A. 0.9% decrease

B. 0.9% increase

C. 1.2% decrease

D. 1.2% increase



Q25 Mathematics

The product of the LCM and the HCF of two numbers is 270. If one of the numbers is 18, find the other number.

A. 15

B. 30

C. 20

D. 27



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Pankaj can do one-fifth of a piece of work in 6 days and Jagath can do one-fourth of the same work in 8 days. Find the number of days taken to complete the work if both work together. (Round the answer to one decimal place.)

A. 15.5



B. 15.8

C. 16.5

D. 14.5

Q2 Mathematics

The following are the marks obtained in a test out of 20 by a group of 10 students. Find the mode of the data.

15, 12, 13, 14, 16, 15, 18, 19, 11, 15.

A. 15



B. 16

C. 18

D. 19

Q3 Mathematics

A man crosses a 375 m road in 75 sec. His speed (in km/h) is:

A. 18



B. 15

C. 13

D. 20

Q4 Mathematics

The price of a bike was increased by 10% and then again increased by 8%. The net percentage increase in the price of the bike is:

A. 17%

B. 18%

C. 18.8%



D. 19%



Q5 Mathematics

If the length of a rectangle is twice its breadth and the perimeter of that rectangle is 42 cm, then find its length (in cm).

- A. 7
- B. 8
- C. 11
- D. 14

**Q6 Mathematics**

The ratio of Teja's and his mother's present ages is 7 : 11. The difference between their ages is 20 years. The age of Teja after 3 years will be:

- A. 29 years
- B. 32 years
- C. 35 years
- D. 38 years

**Q7 Mathematics**

Mr. Rao walks 45 minutes in a day. What fraction of a day does he walk per day, expressed as a fraction?

- A. $\frac{1}{32}$
- B. $\frac{3}{4}$
- C. $\frac{1}{24}$
- D. $\frac{1}{80}$



Q8 Mathematics

Which of the following statements is/are always true?

- a) In a parallelogram, diagonals bisect each other.
- b) In a rectangle, the opposite angles are equal and each measure 90° .
- c) Diagonals of a kite intersect at right angles.

- A. Only (a)
- B. Only (a) and (b)
- C. Only (b) and (c)
- D. All three of (a), (b) and (c)



Q9 Mathematics

The value of $2 - \frac{\cos^2 \theta}{1 + \sin \theta} + \frac{1 + \sin \theta}{\cos \theta} - \frac{\cos \theta}{1 - \sin \theta}$ is:

- A. $1 - \sin \theta$
- B. $1 + \sin \theta$
- C. $1 - \cos \theta$
- D. $1 + \cos \theta$



Q10 Mathematics

If the quadratic equation $ax^2 - 4x + 1 = 0$ has equal roots, then the value of a is:

- A. 4
- B. 3
- C. 2
- D. 1



Q11 Mathematics

If 5 is one root of $x^2 - (a - 1)x + 10 = 0$, then the other root is:

- A. 6
- B. 4
- C. 2
- D. 1



Q12 Mathematics

Two mixtures A and B have the following compositions.

Mixture A has copper and tin in the ratio 1 : 2

Mixture B has copper and tin in the ratio 1 : 3

If equal quantities of mixtures A and B are used for producing mixture C, then find the ratio of copper and tin in mixture C.

A. 1 : 5

B. 2 : 5

C. 7 : 12

D. 7 : 17

**Q13** Mathematics

The value of $3 - 25 \div [12 \div 4 \times 2 - (3 \times 7 \div 21)]$ is:

A. -2



B. -1

C. 2

D. 1

Q14 Mathematics

Express $0.\overline{25}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{25}{90}$

B. $\frac{25}{99}$



C. $\frac{25}{100}$

D. $\frac{25}{10000}$



Q15 Mathematics

Mr. Rao sold a car at ₹1,64,000, thereby incurring a 20% loss. The cost price of the car was:

A. ₹ 2,05,000



B. ₹ 2,50,000

C. ₹ 2,00,500

D. ₹ 2,00,050

Q16 Mathematics

If the area of the base of a cylinder is 3850 cm^2 and its height is twice the radius of its base, then find the volume of the cylinder. [Use $\pi = \frac{22}{7}$]

A. 245340 cm^3

B. 235320 cm^3

C. 269500 cm^3



D. 201250 cm^3

Q17 Mathematics

The measure of each interior angle of a regular octagon is:

A. 135°



B. 140°

C. 165°

D. 180°

Q18 Mathematics

Find the arithmetic mean of the following data.

12, 13, 18, 12, 15, 15, 16, 13, 19, 17

A. 14

B. 15



C. 13.5

D. 15.5



Q19 Mathematics

Pallavi bought a toy for ₹128, decorated it at a cost of ₹15, and sold the toy for ₹130. Find the loss or gain percentage.

A. $\frac{100}{11}\%$ Loss



B. $\frac{100}{11}\%$ Gain

C. 10% Gain

D. 10% Loss

Q20 Mathematics

Two numbers are in the ratio 5 : 3, and the difference between these two numbers is 34. Find the smaller of the two numbers.

A. 85

B. 21

C. 31

D. 51

**Q21** Mathematics

A certain sum under simple interest at a certain rate of interest per annum amounts to ₹1,200 in 2 years and to ₹1,500 in 3 years. The rate of interest per annum is:

A. 10%

B. 15%

C. 25%

D. 50%

**Q22** Mathematics

What is the highest common prime factor of 7140 and 13200?

A. 2

B. 3

C. 5



D. 11



Q23 Mathematics

The LCM of fractions is calculated as $\frac{\text{LCM of the numerators}}{\text{HCF of the denominators}}$. Find the LCM of $\frac{5}{6}$, $\frac{6}{5}$ and $\frac{3}{2}$.

- A. 15
- B. 20
- C. 25
- D. 30



Q24 Mathematics

If $x + y = 5$ and $xy = 4$, find the value of $x^3 + y^3$.

- A. 125
- B. 185
- C. 65
- D. 60



Q25 Mathematics

Find the surface area of a sphere having a radius of 9 cm. [Use $\pi = \frac{22}{7}$]

- A. $1020\frac{4}{7} \text{ cm}^2$
- B. $1018\frac{2}{7} \text{ cm}^2$
- C. $1013\frac{5}{7} \text{ cm}^2$
- D. $1010\frac{6}{7} \text{ cm}^2$



Mathematics

25 Questions • Answer Key

Q1 Mathematics

If a solid sphere of radius 10 cm is melted into 8 spherical solid balls of equal radius, then what will be the surface area of each such ball? [Use $\pi = \frac{22}{7}$]

A. $314\frac{2}{7} \text{ cm}^2$



B. $319\frac{1}{7} \text{ cm}^2$

C. $324\frac{3}{7} \text{ cm}^2$

D. $335\frac{5}{7} \text{ cm}^2$

Q2 Mathematics

The roots of the quadratic equation $x + \frac{20}{x} = 9$ are:

A. 4, 5



B. -4, -5

C. 3, 6

D. -3, -6

Q3 Mathematics

Nilesh bought some quantity of barley for ₹5,000. Half of it is sold at a profit of 20%. If Nilesh wishes to make a profit of 15% on the whole, find the selling price (in ₹) of the remaining barley.

A. 2,750



B. 3,000

C. 3,250

D. 2,500



Q4 Mathematics

A man spends 30% of his salary on groceries, and is left with ₹3,500. Find his total salary.

A. ₹11,000

B. ₹6,000

C. ₹5,000



D. ₹5,500

Q5 Mathematics

A cyclist covered a distance of 900 km in 25 hours. What is the speed of the cyclist (in m/s)?

A. 8

B. 9

C. 11

D. 10



Q6 Mathematics

If α and β are the roots of the equation $x^2 + 5x + 6 = 0$, then the value of $\alpha\beta - \left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$ is:

A. $\frac{41}{6}$



B. $\frac{31}{6}$

C. $-\frac{41}{6}$

D. $-\frac{31}{6}$

Q7 Mathematics

The compound interest on ₹30,000 in 2 years at 7% rate of interest per annum compounded annually is:

A. ₹3,347

B. ₹4,347



C. ₹2,347

D. ₹3,777



Q8 Mathematics

If the measures of the angles of a quadrilateral taken in order are in the ratio 1 : 3 : 1 : 3, then the quadrilateral is a:

- A. square
- B. trapezium, but not a parallelogram
- C. parallelogram
- D. rectangle



Q9 Mathematics

Find x and y in the equivalent fraction given below.

$$\frac{x}{9} = \frac{105}{63} = \frac{5}{y}$$

- A. $x = 3, y = 5$
- B. $x = 12, y = 3$
- C. $x = 15, y = 9$
- D. $x = 15, y = 3$



Q10 Mathematics

Which of the following is divisible by 17?

- A. 991
- B. 1887
- C. 2022
- D. 2989



Q11 Mathematics

Simplify $3x(x + 2) - 5x(x - 3) + 7$.

- A. $2x^2 + 11x + 7$
- B. $-2x^2 + 21x + 6$
- C. $2x^2 + 21x + 7$
- D. $-2x^2 + 21x + 7$



Q12 Mathematics

The product of the LCM and the HCF of 18 and 25 is:

- A. 270
- B. 360
- C. 450
- D. 465



Q13 Mathematics

The value of $\sqrt{\frac{4-5\cos^2\theta}{\sin^2\theta}} + \cot^2\theta$ is:

- A. 4
- B. 3
- C. 2
- D. 1



Q14 Mathematics

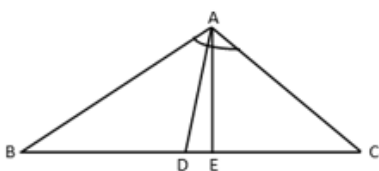
A tradesman allows a discount of 15% on the marked price. How much above the cost price must he mark his goods to gain 19% through the above transaction?

- A. 30%
- B. 40%
- C. 50%
- D. 25%



Q15 Mathematics

In a triangle ABC, if AD is the angle bisector of $\angle BAC$, $AE \perp BC$, $\angle B = 30^\circ$ and $\angle C = 50^\circ$, then $\angle DAE$ is:



- A. 10°
- B. 20°
- C. 30°
- D. 40°



Q16 Mathematics

A tank is attached with 30 pipes, some of these are filling pipes and the rest are emptying pipes. Each filling pipe can fill the tank completely in 24 hours and each emptying pipe can empty the tank completely in 18 hours. When all the pipes are opened together, it takes $1\frac{1}{2}$ hours to fill the tank completely. How many of the given pipes are emptying pipes?

A. 6



B. 8

C. 9

D. 12

Q17 Mathematics

If the difference between two numbers is 4 and their product is 32, then the absolute difference between their cubes is:

A. 484

B. 844

C. 448



D. 444

Q18 Mathematics

If the radius and the height of a cylinder are 7 cm and 15 cm, respectively, then find the volume of the cylinder.

[Use $\pi = \frac{22}{7}$]

A. 2125 cm^3 B. 2310 cm^3 C. 2451 cm^3 D. 2520 cm^3 **Q19** Mathematics

Find the mode of the following data.

2, 6, 5, 2, 4, 9, 6, 2, 66, 4, 10, 12, 6, 22, 2, 44, 9

A. 2



B. 6

C. 4

D. 9



Q20 Mathematics

A has a certain amount of money and B also has some money. If A gives ₹130 to B, then B will have 1.5 times the amount left with A. Instead, if B gives ₹70 to A, then A will have 2 times the amount left with B. What is the total amount of money that A and B together have between them?

A. ₹700

B. ₹720

C. ₹750



D. ₹780

Q21 Mathematics

The population of a town increased by 12% in the first year and by 16% in the second year. What is the percentage increase in the population at the end of the second year with respect to the population at the beginning of the given 2- year period?

A. 19.92%

B. 29.92%



C. 19.6%

D. 29.6%

Q22 Mathematics

Nine years ago, P's age was twice the age of Q. If the ratio of their present ages is 5 : 4, what is the sum of their present ages?

A. 27 years



B. 30 years

C. 35 years

D. 40 years

Q23 Mathematics

Express $0.2\bar{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A. $\frac{1}{6}$ B. $\frac{2}{9}$ C. $\frac{5}{18}$ D. $\frac{1}{3}$ 

Q24 Mathematics

A water tank can be filled in 9 minutes by using 15 pipes of the same capacity. In how many minutes will the water tank be filled if we use 20 pipes of the same capacity as above?

A. 13

B. 10

C. 6.75



D. 18

Q25 Mathematics

If $x = \frac{\sqrt{1125} \times \sqrt{405}}{\sqrt{729}}$, then the value of $\sqrt{x}$ is:

A. 3

B. 5



C. 9

D. 25



Mathematics

25 Questions • Answer Key

Q1 Mathematics

What annual equal payment (in ₹) will discharge a debt of ₹28,700 due in 2 years at 5% p.a., interest compounded annually?

A. 15,345

B. 15,435



C. 15,543

D. 15,534

Q2 Mathematics

5650 increased by 15% equals how much?

A. 6435.00

B. 6795.50

C. 6497.50



D. 6997.25

Q3 Mathematics

The average of the first 7 multiples of 3 is:

A. 11.3

B. 10.5

C. 12.5

D. 12



Q4 Mathematics

Simplify the given expression.

$$2(2x - 3) + 4\left(\frac{x^2}{2} - 3x + 4\right)$$

A. $2x^2 + 8x - 10$ B. $2x^2 - 8x + 10$ C. $2x^2 + 8x + 10$ D. $2x^2 - 8x - 10$ 

Q5 Mathematics

The edges of a cuboid are in the ratio $1 : 2 : 3$ and its volume is 1296 cm^3 . The surface area of the cuboid is:

A. 824 cm^2

B. 748 cm^2

C. 684 cm^2

D. 792 cm^2 ✓

Q6 Mathematics

The length of a rectangle is 20 cm and its breadth is 8 cm. When the length is increased to 25 cm, what will be the breadth of this rectangle if its area remains the same as before?

A. 6.4 cm ✓

B. 6.7 cm

C. 7.2 cm

D. 7.5 cm

Q7 Mathematics

$\frac{5}{12}$ is the same as :

A. $0.\overline{416}$

B. $0.4\overline{16}$

C. $0.41\overline{7}$

D. $0.41\overline{6}$ ✓

Q8 Mathematics

A rectangular courtyard, 7.35 meters long and 5.25 meters wide, is paved with square tiles of the same size. Find the longest possible length of the tiles used for this purpose.

A. 105 centimeters ✓

B. 115 centimeters

C. 120 centimeters

D. 125 centimeters



Q9 Mathematics

If a dishonest shop keeper claims to sell rice at cost price but uses a faulty weight and thus gains 14%, then find the weight he actually gives per kilogram of rice for which a customer pays. (Round the answer to the nearest whole number.)

A. 857 gm

B. 867 gm

C. 877 gm



D. 887 gm

Q10 Mathematics

Which of the options below give the solution to the equation $\frac{1}{x+3} + \frac{1}{x+5} = \frac{1}{6}$?

A. $x = 3 \pm \sqrt{37}$ B. $x = 2 \pm \sqrt{39}$ C. $x = 4 \pm \sqrt{37}$ D. $x = 2 \pm \sqrt{37}$ **Q11 Mathematics**

The value of

$\operatorname{cosec}(47^\circ + \theta) - \sec(43^\circ - \theta) + \tan(61^\circ + \theta) - \cot(29^\circ - \theta) + \sin(45^\circ + \theta) - \cos(45^\circ - \theta)$ is equal to:

A. 1

B. 0

C. $\frac{1}{\sqrt{2}}$ D. $\frac{\sqrt{3}}{2}$ 

Q12 Mathematics

If $4^{3x} - 8^{x+1} + 16 = 0$ is written as a quadratic equation where $y = 2^{3x}$, then which of the options below will represent the quadratic equation mentioned above?

A. $y^2 - 4y + 16 = 0$

B. $4y^2 - 4y + 16 = 0$

C. $y^2 - 8y + 16 = 0$ ✓

D. $4y^2 - 8y + 16 = 0$

Q13 Mathematics

A table and a swing were sold for ₹9,936 each. The table was sold for a profit of 8% and the swing was sold for a loss of 8%. What is the gain or loss percentage in the whole transaction?

A. 0.64% loss ✓

B. 0.64% profit

C. No profit no loss

D. 2% profit

Q14 Mathematics

Two years ago, the ratio of the respective ages of Subash and Pranav was 4 : 5. Three years hence, this ratio will become 5 : 6. The present age of Pranav is:

A. 22 years

B. 25 years

C. 27 years ✓

D. 20 years



Q15 Mathematics

A can do a certain piece of work in 8 days, B can do the same work in 18 days and C can do the same work in 12 days. Find the number of days it will take to complete the same work, if they all work together.

A. $\frac{19}{72}$

B. $\frac{48}{19}$

C. $\frac{19}{48}$

D. $\frac{72}{19}$ ✓

Q16 Mathematics

Evaluate $\sqrt{21 + \sqrt{19 - \sqrt{6 + 3}}}$.

A. 3

B. 4

C. 5 ✓

D. 7

Q17 Mathematics

Eduardo, Abraham and Xavier can finish a certain piece of work in 12, 10 and 15 days, respectively. All three of them started the work together. Eduardo left the work after 2 days and Abraham left just three days before the work was completed. Find the total number of days taken for the work to be completed.

A. 8.6

B. 6.8 ✓

C. 7.8

D. 8



Q18 Mathematics

Which of the following options gives the correct empirical relationship between mean, median and mode of a data set?

- A. $\text{Mean} - \text{Mode} = 3 (\text{Mean} + \text{Median})$
- B. $\text{Mean} + \text{Mode} = 3 (\text{Mean} - \text{Median})$
- C. $\text{Mean} - \text{Mode} = 3 (\text{Mean} - \text{Median})$ ✓
- D. $\text{Mean} + \text{Mode} = 3 (\text{Mean} + \text{Median})$

Q19 Mathematics

If $0.4 : x :: x : 6.4$, and $x > 0$, then find the value of x .

- A. 1.6 ✓
- B. 0.5
- C. 16
- D. 4.64

Q20 Mathematics

If 2 and -3 are the roots of a quadratic equation, then the quadratic equation is:

- A. $x^2 + x + 6 = 0$
- B. $x^2 - x - 6 = 0$
- C. $x^2 + x - 6 = 0$ ✓
- D. $x^2 - x + 6 = 0$

Q21 Mathematics

The difference between two numbers is 18. If the difference between their squares is 360, find the larger number.

- A. 18
- B. 19 ✓
- C. 15
- D. 16



Q22 Mathematics

Find the smaller of the two roots of the equation

$$x^2 + 8x + 15 = 0.$$

A. $x = -5$



B. $x = -3$

C. $x = 5$

D. $x = 3$

Q23 Mathematics

The length of each side of a rhombus is 20 cm, and the length of one of its diagonal is 30 cm. Find the length (in cm) of its other diagonal.

A. $\sqrt{175}$

B. $10\sqrt{7}$



C. $6\sqrt{7}$

D. $\sqrt{7}$

Q24 Mathematics

In $\triangle ABC$ and $\triangle DEF$, if $AB = DE$, $AC = EF$ and $BC = DF$, then which of the following is true based on SSS theorem?

A. $\triangle ABC \cong \triangle DEF$

B. $\triangle ABC \cong \triangle EFD$

C. $\triangle ABC \cong \triangle FDE$

D. $\triangle ABC \cong \triangle EDF$

**Q25** Mathematics

Find the HCF of 12, 16 and 24.

A. 4



B. 48

C. 24

D. 16



Mathematics

25 Questions · Answer Key

Q1 Mathematics

Find the arithmetic mean of the following data.

x	6	10	18	24	30	36
f	4	3	4	2	1	1

A. 12

B. 13

C. 16



D. 17

Q2 Mathematics

If $a = 28 - 5\sqrt{12}$ and $b = 2 + \sqrt{3}$, find the value of $(a\sqrt{3} + b)$.A. $-28 + 29\sqrt{3}$ B. $31 - 8\sqrt{3}$ C. $32 + 27\sqrt{3}$ D. $-30 + 30\sqrt{3}$

Q3 Mathematics

If pipe A can fill a cistern in X hours, pipe B can fill the same cistern in Y hours, and pipe C can empty the full cistern in Z hours, then find the time taken to completely fill the cistern, if Pipes A, B and C are opened together.

A. $\frac{XYZ}{YZ + XZ - XY}$ B. $\frac{XYZ}{YZ - XZ - XY}$ C. $\frac{XYZ}{YZ + XZ + XY}$ D. $\frac{XYZ}{YZ - XZ + XY}$ 

Q4 Mathematics

Find the LCM of 20, 120 and 60.

- A. 60
- B. 80
- C. 100
- D. 120



Q5 Mathematics

What is the compound interest, rounded to nearest rupee, on ₹82,000 for 3 years at 6% per annum compounded annually?

- A. ₹14,674
- B. ₹15,366
- C. ₹15,663
- D. ₹15,000



Q6 Mathematics

If p and q are co-primes, then p^7 and q^9 are:

- A. co-primes, but not composite numbers
- B. primes
- C. composite numbers, but not co-primes
- D. co-primes, and composite numbers



Q7 Mathematics

The nature of the roots of the quadratic equation $x^2 + 4x + 8 = 0$ is:

- A. not real roots
- B. real, irrational, unequal roots
- C. real, rational, unequal roots
- D. real, rational, equal roots



Q8 Mathematics

If $x \neq y$, and $x^2y - xy^2 : yz(x - y) :: xa^2 - xb^2 : w$, then which of the options below gives an expression equivalent to w ?

A. $za^2 + zb^2$

B. $yza^2 - yzb^2$

C. $za^2 - zb^2$ ✓

D. $a^2 - b^2$

Q9 Mathematics

If the volume of a sphere is 4851 cm^3 , then find the radius of the sphere. [Use $\pi = \frac{22}{7}$]

A. 10.5 cm ✓

B. 11.5 cm

C. 12.5 cm

D. 13.5 cm

Q10 Mathematics

Simplify the given expression.

$$3x(x - 9) - 9x^2 + 2x + 24 - x^3$$

A. $24 - 25x - 6x^2 - x^3$ ✓

B. $24 - 25x - 6x^2 + x^3$

C. $24 - 25x + 6x^2 - x^3$

D. $24 + 25x - 6x^2 - x^3$

Q11 Mathematics

Identify the quadratic equation one of whose roots is $4 + \sqrt{3}$.

A. $x^2 + 8x + 13 = 0$

B. $x^2 - 8x + 13 = 0$ ✓

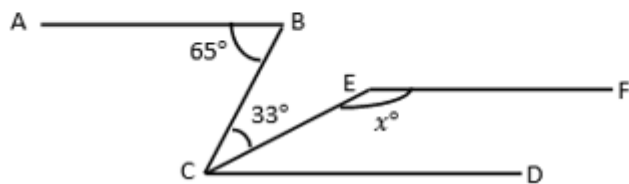
C. $x^2 - 8x + 11 = 0$

D. $x^2 + 8x + 11 = 0$



Q12 Mathematics

In the given figure, $AB \parallel CD \parallel EF$. The value of x° is:



A. 147°

B. 148° ✓

C. 115°

D. 126°

Q13 Mathematics

Simplify $\left(\frac{16a^{\frac{4}{3}}b^{\frac{-5}{6}}}{a^{\frac{-2}{3}}b^{\frac{1}{6}}} \right)^{\frac{1}{2}}$.

A. $\frac{1}{(ab)^{\frac{1}{2}}}$

B. $\frac{a}{\frac{1}{b^2}}$

C. $\frac{4a}{\frac{1}{b^2}}$ ✓

D. $\frac{4a}{b^2}$

Q14 Mathematics

The marks of a student increased from 10 to 12. Find the percentage increase in the marks.

A. 12%

B. 20% ✓

C. 2%

D. 17%



Q15 Mathematics

Deeksha travels in her car from City A to City B at a speed of 120 km/h, and while coming back by the same route from City B to City A, she travels at a speed of 130 km/h. Find Deeksha's average speed during the whole journey

- A. 123.9 km/h
- B. 122.8 km/h
- C. 125.0 km/h
- D. 124.8 km/h

**Q16** Mathematics

If the base area of a right circular cylinder is 346.50 cm^2 and its height is 21 cm, then find its total surface area.

[Use $\pi = \frac{22}{7}$]

- A. 2079 cm^2
- B. 2145 cm^2
- C. 2231 cm^2
- D. 2352 cm^2

**Q17** Mathematics

If $3 \sin^2 \theta + 7 \cos^2 \theta = 6$ and $0 < \theta \leq 90^\circ$, then the value of θ is:

- A. 90°
- B. 60°
- C. 45°
- D. 30°

**Q18** Mathematics

If $\sqrt{y} \div \sqrt{121} = 0.03$, then find the value of y , giving your answer correct to 3 decimal places.

- A. 0.109
- B. 0.176
- C. 1.760
- D. 1.640



Q19 Mathematics

If $a\%$ is the first discount and $b\%$ is the second discount on the marked price of an article, then an equivalent single discount percentage is given by:

A. $a + b + \frac{ab}{100}$

B. $a + b - \frac{ab}{100}$ ✓

C. $a + b - \frac{a + b}{100}$

D. $a + b - \frac{a - b}{100}$

Q20 Mathematics

Straight line FB is parallel to straight line GD. A is a point on straight line FB and C is a point on straight line GD. E is a point between FB and GD such that $\angle BAE = 118^\circ$ and $\angle DCE = 112^\circ$. What is the measure of $\frac{1}{2} \angle AEC$?

A. 62°

B. 65° ✓

C. 72°

D. 75°

Q21 Mathematics

A number is split into two parts such that one part is 14 more than the other, and the ratio of the two parts is 7 : 5. Find the number.

A. 84 ✓

B. 35

C. 49

D. 54



Q22 Mathematics

Prakash and Vinesh can complete a certain piece of work in 12 and 14 days, respectively. They started to work together, and after 3 days, Vinesh left. In how many days will Prakash complete the remaining work?

A. $\frac{44}{7}$

B. $\frac{43}{8}$

C. $\frac{45}{7}$ ✓

D. 44

Q23 Mathematics

If $21.134 \times 10^x = 0.0021134$, then find the value of x .

A. -4 ✓

B. -3

C. -2

D. 0

Q24 Mathematics

The ages of two persons differ by 14 years. If 4 years ago, the elder one was three times as old as the younger one, then the present age of younger one is:

A. 10 years

B. 11 years ✓

C. 12 years

D. 13 years

Q25 Mathematics

The marked price of a car is ₹5,00,000. Under a scheme successive discount of 10% and 8% are offered on it. Find the total discount offered while selling the car under the given scheme.

A. ₹76,000

B. ₹90,000

C. ₹82,000

D. ₹86,000 ✓



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Find the HCF of 0.24 and 0.36.

A. 0.72

B. 0.12



C. 0.52

D. 0.32

Q2 Mathematics

If $x = 5$, then find the value of $16 \times x \sqrt{x^3 - x^2}$.

A. 600

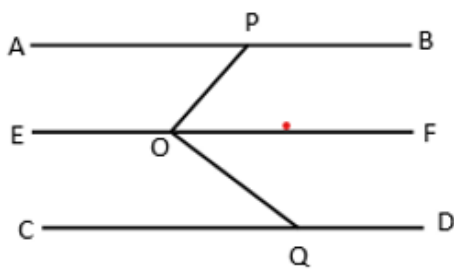
B. 700

C. 800



D. 900

Q3 Mathematics

In the given figure, $AB \parallel CD \parallel EF$, $\angle APO = 35^\circ$ and $\angle CQO = 43^\circ$. The value of $\angle EOP + \angle EOQ$ is:A. 276° B. 282° C. 264° D. 290° 

Q4 Mathematics

The HCF of fractions is calculated as $\frac{\text{HCF of the numerators}}{\text{LCM of the denominators}}$. Find the HCF of $\frac{2}{3}$, $\frac{4}{5}$ and $\frac{3}{2}$.

A. $\frac{5}{30}$

B. $\frac{3}{50}$

C. $\frac{1}{40}$

D. $\frac{1}{30}$ ✓

Q5 Mathematics

A shopkeeper sells a pair of shoes at a discount of 34% and still makes a profit of 10%. If the cost price of the pair of shoes is ₹480, find its marked price.

A. ₹800 ✓

B. ₹700

C. ₹850

D. ₹820

Q6 Mathematics

If $x = \sqrt{13 + 2\sqrt{40}}$ and $y = \sqrt{13 - 2\sqrt{40}}$, then what is the value of $(x - y)$?

A. $4\sqrt{5}$

B. $3\sqrt{2}$

C. $2\sqrt{5}$ ✓

D. $6\sqrt{2}$

Q7 Mathematics

A seller makes a profit of 20%. If he uses 10% lesser weight than the actual weight while selling goods, what is his actual profit percent?

A. 33.3% ✓

B. 15%

C. 36.6%

D. 30%



Q8 Mathematics

Find the simple interest on ₹9,600 at 7.2% per annum for 5 years.

A. ₹2,416

B. ₹3,456



C. ₹4,356

D. ₹3,546

Q9 Mathematics

The income of Hari is ₹42,000 per month. He spends 15% on rent, 8% on food, 45% on other things, and saves the remaining amount. What is the amount he saves per month?

A. ₹14,400

B. ₹13,440



C. ₹25,440

D. ₹28,560

Q10 Mathematics

16 years ago, the age of the father was 4 times the age of his son. Now the father is twice as old as his son. What is the difference between the present ages of the father and his son?

A. 24 years



B. 28 years

C. 12 years

D. 16 years

Q11 Mathematics

In a movie theatre, the price of the ticket per kid is \$2 while per adult it is \$5. On a particular day, 2000 people bought tickets and an amount of \$5,050 was collected. Find the number of \$2 tickets sold on that day.

A. 1650



B. 350

C. 1560

D. 1570



Q12 Mathematics

Hema can do a certain piece of work in 21 days. Hema and Raji can together do the same work in 18 days, and Hema, Raji and Smitha can do the same work together in 14 days. In how many days can Hema and Smitha do the same work, working together?

A. 63

B. $\frac{63}{4}$ ✓C. $\frac{63}{5}$ D. $\frac{36}{5}$ **Q13 Mathematics**

Vishnu purchased 8000 products for ₹1.2 each, another 3000 products for ₹1.5 each and another 5000 products for ₹ 1.4 each. Find the average cost per product. (Round the answer to two decimal places.)

A. ₹1.41

B. ₹1.27

C. ₹1.39

D. ₹1.32 ✓

Q14 Mathematics

If $2xy^2 : 2x^2y :: 2x^2y : z$, which of the options below gives an expression equivalent to z ?

A. $4xy$ B. $4x^2y^2$ C. $2x^2$ D. $2x^3$ ✓**Q15 Mathematics**

A cuboidal hall is 15 m long and 10 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of the four walls, then the volume of the hall is:

A. 900 m^3 ✓B. 840 m^3 C. 790 m^3 D. 930 m^3 

Q16 Mathematics

Each interior angle of a regular polygon of n sides is 144° . The number of sides (n) of the polygon is:

- A. 8
- B. 9
- C. 10
- D. 12

**Q17** Mathematics

Pipes A and B can fill an empty cistern in 16 minutes and 32 minutes, respectively. Both Pipe A and Pipe B are opened together. After how much time should Pipe A be turned off so that the empty cistern is completely filled in a total of 16 minutes?

- A. 9 min
- B. 7 min
- C. 8 min
- D. 6 min

**Q18** Mathematics

Using $\pi = \frac{22}{7}$, find the circumference of a circle whose diameter is 38.5 cm.

- A. 121 cm
- B. 154 cm
- C. 165 cm
- D. 170 cm

**Q19** Mathematics

If $3 + 2\sqrt{2}$ and $3 - 2\sqrt{2}$ are the roots of a quadratic equation, then the quadratic equation is:

- A. $x^2 - 6x - 1 = 0$
- B. $x^2 + 6x + 1 = 0$
- C. $x^2 - 6x + 1 = 0$
- D. $x^2 + 6x - 1 = 0$



Q20 Mathematics

The average of 7 numbers was given as 53. Later it was found that one number was misread as 16 instead of 58. What is the correct average of the given 7 numbers?

A. 59



B. 55

C. 56

D. 52

Q21 Mathematics

The cost of two chairs and three tables is ₹1,650. If the cost of a chair is ₹150 less than that of a table, then find the cost of a table.

A. ₹400

B. ₹290

C. ₹390



D. ₹380

Q22 Mathematics

What is the difference between the biggest and the smallest fractions among $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{5}$ and $\frac{5}{6}$?

A. $\frac{1}{3}$ B. $\frac{1}{6}$ C. $\frac{1}{9}$ D. $\frac{1}{12}$ **Q23** Mathematics

Simplify the given expression.

$$3x(x - 3) + 2(3x^2 - 4)$$

A. $9x^2 + 9x - 8$ B. $9x^2 - 9x + 8$ C. $9x^2 - 9x - 8$ D. $9x^2 + 9x + 8$ 

Q24 Mathematics

If θ is an acute angle, and $\cos \theta = \frac{12}{13}$, then the value of $\frac{13 \sin \theta + 12 \sec \theta}{12 \tan \theta + 5 \operatorname{cosec} \theta}$ is:

A. 1



B. 2

C. $\frac{1}{2}$ D. $\frac{3}{2}$

Q25 Mathematics

If one root of the equation $(k + 1)x^2 - 13kx + 7 - 2k = 0$ is the reciprocal of the other, then the value of k is:

A. 4

B. 2



C. -2

D. -4



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Currently Hema is 48 years old and Roja is 32 years old. How many years ago was the ratio of their ages 5 : 3?

A. 8 years



B. 9 years

C. 7 years

D. 6 years

Q2 Mathematics

The external length, breadth and depth of a cuboidal iron storage space are 4 m, 3.6 m, and 1.5 m, respectively. It is open at the top. What is the cost (in ₹) of painting its outer surface at the rate of ₹55 per m^2 ?

A. 1,936

B. 1,991

C. 2,046



D. 2,838

Q3 Mathematics

Which of the following is divisible by 9?

A. 1099

B. 2121

C. 2352

D. 3132



Q4 Mathematics

Find the gain percentage, given that Bushra sold her scooter for ₹15,000 gaining one-fifth of the selling price.

A. 10%

B. 15%

C. 25%



D. 20%



Q5 Mathematics

Arun is the elder brother of Kiran. The difference in their ages is 20 years. If 5 years ago, Arun was 5 times as old as Kiran then was, then find the present age (in years) of Arun.

A. 10

B. 20

C. 30



D. 40

Q6 Mathematics

If the arithmetic mean of 11, 15, 13, p and 10 is 11, then the value of p is:

A. 5

B. 6



C. 7

D. 8

Q7 Mathematics

Find the ratio between the LCM and the HCF of 5, 15 and 20.

A. 8 : 1

B. 14 : 3

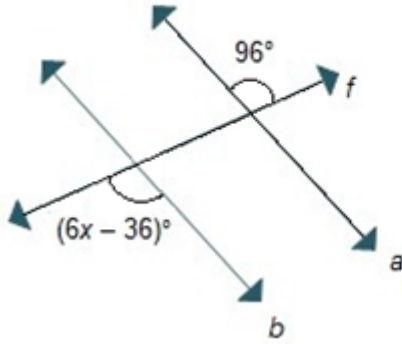
C. 11 : 2

D. 12 : 1



Q8 Mathematics

In the given figure, line a is parallel to line b . Find the value of x .



A. 32°

B. 36°

C. 96°

D. 22°



Q9 Mathematics

Arrange the numbers given below in ascending order.

705.0, 7.005, 7.500, 70.50, 7050, 7.050, 75

A. 7.005, 7.500, 7.050, 70.50, 75, 705.0, 7050

B. 7.005, 7.050, 7.500, 70.50, 75, 705.0, 7050

C. 7.005, 7.500, 7.050, 75, 70.50, 705.0, 7050

D. 7050, 705.0, 75, 70.50, 7.500, 7.050, 7.005



Q10 Mathematics

If $\sin^2 x + 3 \cos^2 x = 2$, and $(0^\circ < x < 90^\circ)$, find the value of $\operatorname{cosec} x$.

A. $\sqrt{2}$

B. 2

C. $\sqrt{3}$

D. $\frac{2\sqrt{3}}{3}$



Q11 Mathematics

The width of a rectangle is one-third of its length. If the perimeter of the rectangle is 64 cm, find the width of the rectangle.

A. 24 cm

B. 21 cm

C. 8 cm



D. 16 cm

Q12 Mathematics

The graph of $y = 9x^2 + 16$:

A. intersects the x-axis at $-\frac{4}{3}$ and $\frac{4}{3}$ B. touches the x-axis at $\frac{4}{3}$

C. either intersects or touches the x-axis

D. neither intersects nor touches the x-axis

**Q13** Mathematics

Mr. X travelled 220 km, 250 km and 140 km at a speed of 11 km/h, 5 km/h and 7 km/h, respectively. Find his average speed in km/h.

A. $7\frac{7}{9}$ B. $6\frac{2}{9}$ C. $6\frac{5}{9}$ D. $6\frac{7}{9}$ **Q14** Mathematics

Find the value of n , when $216^{\frac{2}{n}} = 36$.

A. 9

B. 6

C. 3



D. 1



Q15 Mathematics

20% of the population of a city died due to war, and of the remaining population, 5% died in an epidemic. If the present population of the city is 15,200, then find the population of the city before the war.

A. 19,680

B. 20,100

C. 23,500

D. 20,000 ☒**Q16** Mathematics

A man sells potatoes at ₹27 per kg, which he bought at ₹25 per kg. He also uses a faulty weight and each time gives 800 g instead of 1 kg. His actual gain percentage is:

A. 20%

B. 25%

C. 35% ☒

D. 40%

Q17 Mathematics

Find the total surface area of a solid right circular cylinder whose radius of base is 2 cm, and the height is 10 cm.

A. $48\pi \text{ cm}^2$ ☒B. $84000\pi \text{ cm}^2$ C. $8.4\pi \text{ cm}^2$ D. $840000\pi \text{ cm}^2$ **Q18** Mathematics

If $25 : 15 :: 15 : x$, then find the value of x.

A. 9 ☒

B. 11

C. 13

D. 15



Q19 Mathematics

A person borrows ₹20,000 at 25% compound interest per year, compounded annually. At the end of every year, he pays ₹2,500 as part payment. How much does he still owe after two such instalments?

A. ₹25,625



B. ₹25,725

C. ₹25,825

D. ₹25,925

Q20 Mathematics

Evaluate $\left(\frac{-5}{7}\right)^{-6} \times \left(\frac{-5}{7}\right)^4$.

A. $\frac{49}{25}$ B. $\frac{25}{49}$ C. $\frac{343}{125}$ D. $\frac{125}{343}$ **Q21** Mathematics

Find the arithmetic mean of the given frequency distribution.

Marks	Frequency
50	3
28	4
85	6
40	7

A. 52.6



B. 56.2

C. 40.95

D. 50.5



Q22 Mathematics

The value of $\sqrt{2 + \sqrt{2 + \sqrt{2 + \dots}}}$ is:

A. 2



B. 1.75

C. 2.5

D. 1.5

Q23 Mathematics

X people were given a contract for doing a piece of work in 15 days. 3 people did not turn up to work due to sickness, and the rest of the people completed the work in 20 days. What is the value of X?

A. 12



B. 15

C. 10

D. 14

Q24 Mathematics

The ratio of the ages of Arjun and Dharma is 4 : 5. Four years ago, this ratio was 10 : 13. What will be the ratio of their ages after 3 years?

A. 9 : 11



B. 8 : 13

C. 7 : 9

D. 5 : 7

Q25 Mathematics

In a triangle ABC, the lengths of its sides $\overline{AB}$, $\overline{AC}$ and $\overline{BC}$ are 4 cm, 5 cm and 6 cm, respectively. An angle bisector $\overline{AD}$ is drawn from A onto $\overline{BC}$, intersecting $\overline{BC}$ at D. Find $m(\overline{BD})$, correct to two places of decimal.

A. 1.50 cm

B. 2.67 cm



C. 2.25 cm

D. 3.00 cm



Mathematics

25 Questions • Answer Key

Q1 Mathematics

$\Delta ABC \sim \Delta QPR$ and $(\text{area of } \Delta ABC) : (\text{area of } \Delta PQR) = 3 : 2$. If $AB = 12$ cm, $BC = 10$ cm, and $AC = 9$ cm, then the length of QR (in cm) is:

A. $\frac{20}{\sqrt{3}}$

B. $3\sqrt{6}$ ✓

C. $\frac{10}{\sqrt{3}}$

D. $8\sqrt{3}$

Q2 Mathematics

If $a = \left(\frac{3}{7}\right)^2 \div \left(\frac{9}{7}\right)^0$, then find the value of a^{-2} .

A. $\frac{81}{2401}$

B. $\frac{2401}{81}$ ✓

C. $\frac{343}{81}$

D. $\frac{81}{343}$

Q3 Mathematics

The sum of 6 times Bob's age and 5 times Will's age is 43 years, and the sum of 5 times Bob's age and 5 times Will's age is 40 years. Find the age of Bob.

A. 1 year

B. 10 years

C. 3 years ✓

D. 5 years



Q4 Mathematics

The radius of the base of a right circular closed cylinder is 3.5 cm and its total surface area is 269.5 cm^2 . What is the ratio of its height to its diameter? (Take $\pi = \frac{22}{7}$)

A. 4 : 5

B. 5 : 7

C. 7 : 5

D. 5 : 4

**Q5 Mathematics**

6 men and 10 women complete a work in 10 days. 5 men and 4 women complete the same work in 14 days. How many days will it take for 1 woman to complete the same work?

A. 390

B. 280

C. 350

D. 364

**Q6 Mathematics**

8 men and 13 women can complete a piece of work in 12 days, and 10 men and 14 women can complete the same work in 10 days. The work of how many women is equivalent to that of one man?

A. 3

B. 2

C. 1.5

D. 4

**Q7 Mathematics**

Ramu is older than Lakshman by 4 years. If their present ages are in the ratio 6 : 5, how old is Lakshman?

A. 18 years

B. 20 years



C. 22 years

D. 24 years



Q8 Mathematics

The roots of the quadratic equation $x^2 - 4x - 1 = 0$ are:

A. $-2 \pm \sqrt{5}$

B. $2 \pm \sqrt{5}$ ✓

C. $2 \pm \sqrt{3}$

D. $-2 \pm \sqrt{3}$

Q9 Mathematics

Solve the given equation.

$$(5x^2 - 5) + 5(-x^2 + 2x - 7) = 0$$

A. $x = 2$

B. $x = -2$

C. $x = -4$

D. $x = 4$ ✓

Q10 Mathematics

Which of the following is equal to $0.1\overline{82}$?

A. $\frac{181}{990}$ ✓

B. $\frac{1}{9}$

C. $\frac{1}{999}$

D. $\frac{81}{500}$



Q11 Mathematics

Surbhi invested a total sum of ₹47,740 in three schemes A, B and C such that the simple interest received from scheme A at 10% p.a. after 3 years, from scheme B at 9% p.a. after 4 years and from scheme C at 8% p.a. after 5 years were the same. What is the positive difference (in ₹) between the sums invested in schemes C and A?

A. 1,540

B. 3,080

C. 3,840

D. 4,620

**Q12** Mathematics

Raghu sold an article at a loss of 15%. If he had bought the item at 5% less and had sold it for ₹195 more, then he would have gained 10%. Find the cost price (in ₹) of the article.

A. 1,500

B. 1,000

C. 750

D. 1,250

**Q13** Mathematics

Find the median of the frequency distribution given below.

Marks	Frequency
30	4
40	7
50	2
85	6

A. 10

B. 50

C. 30

D. 40



Q14 Mathematics

In $\triangle ABC$, $m(\overline{AB}) = m(\overline{AC})$, and $m\angle BAC = 30^\circ$. If the side BC of $\triangle ABC$ is extended to D , then find $m\angle ACD$.

A. 105°



B. 75°

C. 50°

D. 120°

Q15 Mathematics

The ratio of the length and the width of a rectangle is $5 : 2$. If the width of the rectangle is 48 cm, find the length of the rectangle.

A. 120 cm



B. 102 cm

C. 186 cm

D. 168 cm

Q16 Mathematics

The area of a right-angled triangle, whose base is 24 cm and hypotenuse is 26 cm, is:

A. 312 cm^2

B. 240 cm^2

C. 130 cm^2

D. 120 cm^2

**Q17** Mathematics

If a 1950 m long train crosses a pole in 150 seconds, then find the time (in seconds) taken by the train to cross a 338 m long platform.

A. 175

B. 176



C. 170

D. 174



Q18 Mathematics

If the sum and the product of the roots of a quadratic equation are $\frac{q}{p}$ and $\frac{r^2}{q}$, respectively, where $p, q \neq 0$, then the quadratic equation and the discriminant of the quadratic equation are given, respectively, as:

- A. $pqx^2 + q^2x + pr^2 = 0$ and $q^2 - 4p^2r^2$
- B. $pqx^2 - q^2x + pr^2 = 0$ and $q^4 + 4p^2r^2q$
- C. $pqx^2 - q^2x + pr^2 = 0$ and $q^4 - 4p^2r^2q$ ✓
- D. $pqx^2 + q^2x + pr^2$ and $q^4 - 4p^2r^2q$

Q19 Mathematics

If $\cot^4 x + \cot^2 x = 1$, then the value of $\operatorname{cosec}^4 x - \operatorname{cosec}^2 x$ is:

- A. 4
- B. 2
- C. -1
- D. 1 ✓

Q20 Mathematics

Two numbers are in the ratio 5 : 7. If the sum of the numbers is 108, find the smaller number.

- A. 36
- B. 42
- C. 45 ✓
- D. 47

Q21 Mathematics

The average speed of a car for a given 4-hour journey is 60 km/h. If it travels at 65 km/h for the first 2 hours, then the speed of the car in the next 2 hours is:

- A. 50 km/h
- B. 53 km/h
- C. 55 km/h ✓
- D. 60 km/h



Q22 Mathematics

In the set $\{61, 62 \dots 100\}$, find the sum of the second largest and the second smallest primes.

A. 150

B. 156



C. 158

D. 164

Q23 Mathematics

Four bells toll at intervals of 2, 4, 6 and 8 seconds, respectively. They chimed together at 12 noon. How many times will they chime together in the next 50 minutes, excluding their chiming at 12 noon, but including the one at 12:50 p.m.?

A. 123

B. 124

C. 125



D. 126

Q24 Mathematics

6 kg of ₹48 per kg rice is mixed with 3 kg of another variety of rice to get a mixture costing ₹60 per kg. What is the price per kg of another variety rice in the mixture?

A. ₹80

B. ₹72

C. ₹64

D. ₹84

**Q25** Mathematics

If $x = 2$, then find the value of $\sqrt{(4x)(x) + 4x + 1} + 5x$.

A. 9

B. 13

C. 15



D. 17



Mathematics

25 Questions · Answer Key

Q1 Mathematics

The roots of the quadratic equations $6x^2 - 11x + 3 = 0$ are:

A. $\frac{1}{3}, \frac{3}{2}$



B. $\frac{1}{3}, \frac{2}{3}$

C. $\frac{1}{2}, \frac{3}{2}$

D. $\frac{2}{3}, \frac{3}{2}$

Q2 Mathematics

Hema is the mother of Deeksha. 10 years ago, the age of Hema was 3 times the then age of Deeksha. After 10 years, Hema will be twice as old as Deeksha will then be. Find the present age (in years) of Deeksha.

A. 20

B. 30



C. 15

D. 50

Q3 Mathematics

Find the mode of the given frequency distribution.

Marks	Frequency
51	3
29	4
85	6
40	7

A. 51

B. 85

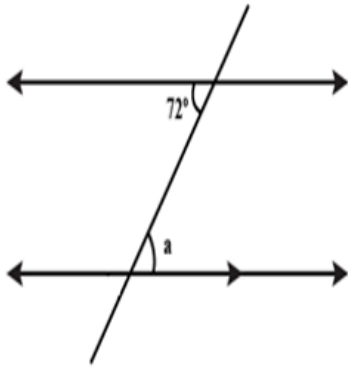
C. 7

D. 40



Q4 Mathematics

In the given figure, a pair of parallel lines are intersected by a transversal. Find the value of angle a.



A. 72°



B. 36°

C. 96°

D. 108°

Q5 Mathematics

One year ago, Praveena was four times as old as her daughter. Six years hence, Praveena's age will exceed twice her daughter's age by 7 years. What is the sum of their present ages?

A. 32 years

B. 35 years

C. 37 years



D. 39 years

Q6 Mathematics

Find the least number which, when divided by 12, 16 and 18, leaves a remainder of 5 in each case.

A. 144

B. 145

C. 147

D. 149



Q7 Mathematics

The selling price of 10 books is equal to the cost price of 15 books. Find the loss or gain percentage.

A. $\frac{100}{3}\%$ Gain

B. 50% Loss

C. $\frac{100}{3}\%$ Loss

D. 50% Gain

**Q8 Mathematics**

In a parallelogram ABCD, if $m\angle A = (3x + 16)^\circ$ and $m\angle B = (2x + 24)^\circ$, then find $m\angle C$.

A. 28°

B. 56°

C. 100°



D. 110°

Q9 Mathematics

A solid metallic cuboid of dimensions $9\text{ cm} \times 32\text{ cm} \times 48\text{ cm}$ is melted and recast into 8 identical cubes. What is the sum of the lateral surface areas (in cm^2) of 5 such cubes?

A. 2160

B. 2880



C. 3600

D. 4320

Q10 Mathematics

The present age of a father is 5 years more than three times the age of his daughter. Four years hence, the father's age will be 8 years more than twice the age of his daughter. The present age of the daughter is:

A. 6 years

B. 7 years



C. 8 years

D. 9 years



Q11 Mathematics

20, 38, 40 and x are in proportion. Find the value of x.

A. 66

B. 70

C. 74

D. 76

**Q12** Mathematics

10 men can dig a well 50 feet deep in 8 days. How many men can dig a well 100 feet deep in 10 days?

A. 18

B. 14

C. 15

D. 16

**Q13** Mathematics

A man's monthly income is ₹50,000. He spends 25% of it on tax, 30% of the remaining income on household expenses, and 10% of the still remaining income on entertainment. He saves the remaining part of his income. How much money will the man save per year, assuming that the above data is same for all 12 months?

A. ₹2,83,050

B. ₹2,38,500

C. ₹2,85,300

D. ₹2,83,500

**Q14** Mathematics

The value of the discriminant of the quadratic equation $9x + 2x^2 = 5$ is:

A. 41

B. 184

C. -176

D. 121



Q15 Mathematics

Simplify the following.

$$\frac{1}{12} + \frac{1}{16} - \frac{1}{8}$$

A. $\frac{13}{48}$

B. $\frac{1}{48}$ ✓

C. $\frac{1}{24}$

D. $\frac{3}{24}$

Q16 Mathematics

The value of $\sin 30^\circ - \cos 60^\circ + \tan 45^\circ + \operatorname{cosec} 60^\circ$ is:

A. $\frac{3 - 2\sqrt{3}}{3}$

B. $\frac{3 + 2\sqrt{3}}{3}$ ✓

C. $\frac{2\sqrt{3}}{3}$

D. 2

Q17 Mathematics

In which of the pairs of numbers below none of the two numbers is a prime number, but the two numbers are co-primes?

A. (11, 17)

B. (8, 25) ✓

C. (21, 35)

D. (19, 27)



Q18 Mathematics

One side of a triangle is 7 metres longer than twice the smallest side. Another side is 5 metres longer than three times the smallest side. If the perimeter of the triangle is 90 metres, find the length of its smallest side.

A. 13 m



B. 10 m

C. 12 m

D. 9 m

Q19 Mathematics

A toy is made of a solid cube and a solid cuboid. Each side of the cube is 5 cm long, and the cuboid has dimensions given as 5 cm × 2 cm × 8 cm. What is the volume of the toy?

A. 205 cm³B. 250 cm³C. 215 cm³D. 225 cm³**Q20** Mathematics

Find the value of $\sqrt{\frac{(0.05)^2 + (0.15)^2 + (0.053)^2}{0.005^2 + 0.015^2 + 0.0053^2}}$.

A. 10

B. 10²C. 10³D. 10⁴**Q21** Mathematics

The cost of a camera is ₹25,000. A leather case costing ₹2,750 was also sold along with this. Arti bought these two items. After using them for few years, she sold them for ₹26,085. What is the loss percentage?

A. 4%

B. 8%

C. 6%



D. 5%



Q22 Mathematics

What time is required for a 150 m long train to cross a 100 m long tunnel, if the train travels at a speed of 25 km/h?

- A. 30 seconds
- B. 25 seconds
- C. 36 seconds
- D. 32 seconds

**Q23 Mathematics**

The total amount payable at maturity on a certain sum invested at simple interest at 8% p.a. for $3\frac{1}{2}$ years exceeds the simple interest payable on the same sum at 10.5% p.a. for 12 years by ₹156. The sum (in ₹) is:

- A. 7,500
- B. 7,800
- C. 8,000
- D. 8,200

**Q24 Mathematics**

Simplify $(3^{-1} \times 6^{-1})^{-1} + 3^{-1}$

- A. 45
- B. 54
- C. 65
- D. 56

**Q25 Mathematics**

In a Lions Club, 70% of the members are young and 30% of the members are old. The average age of the old members is 40 years and that of the young members is 20 years. What is the average age of all the members (in years)?

- A. 26
- B. 24
- C. 28
- D. 22



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Kamal is the father of Vishnu. The sum of their present ages is 60 years. If 6 years ago, Kamal's age was 5 times the then age of Vishnu, then find the present age (in years) of Vishnu.

A. 10

B. 15

C. 20

D. 14



Q2 Mathematics

A show ticket costs ₹7.50 for a parent and ₹3 for a child. If a total of ₹5,925 is collected by selling 952 tickets in all, then find the number of children's tickets sold.

A. 682

B. 300

C. 270

D. 500



Q3 Mathematics

A sum of money triples itself at a certain rate of compound interest in 10 years. In how many years will it amount to 9 times of itself?

A. 15 years

B. 20 years

C. 25 years

D. 30 years



Q4 Mathematics

Vishnu scored X runs in his 10th innings. After scoring those runs, his average per innings increased by 8 runs. If the new average is 28, then find the value of X.

A. 110

B. 105

C. 100

D. 90



Q5 Mathematics

The sum of two numbers is 205. If one of these numbers is reduced by 5% and the other is increased by 10%, the resulting numbers are equal to each other. Find the smaller of the two initial numbers.

A. 95



B. 110

C. 100

D. 105

Q6 Mathematics

Find the area of a triangle whose sides measure 42 cm, 36 cm and 34 cm, respectively.

A. $56\sqrt{110}\text{ cm}^2$



B. $112\sqrt{110}\text{ cm}^2$

C. $28\sqrt{55}\text{ cm}^2$

D. $14\sqrt{55}\text{ cm}^2$

Q7 Mathematics

Find the value of n , when $2^{-7} \times 2^{3n+4} = 2^{11} \div 2^5$.

A. 2

B. 4

C. 5

D. 3

**Q8 Mathematics**

A shopkeeper finds that when he sells one kind of rice at ₹50 per kg he loses 20% and when he sells another kind of rice at ₹72 per kg he gains 20%. If he mixes them in the ratio 3 : 2 and sells the mixture at ₹64 per kg., then what is his overall gain percentage (correct to one decimal place)?

A. 4.1%



B. 4.5%

C. 5.4%

D. 5.6%



Q9 Mathematics

In $\triangle ABC$, $\overline{AD}$ bisects $\angle A$ and D is a point on $\overline{BC}$. If $m(\overline{AC}) = 4.2$ cm, $m(\overline{BD}) = 4$ cm and $m(\overline{BC}) = 7$ cm, then find $m(\overline{AB})$.

A. 5.2 cm

B. 5.6 cm



C. 4.8 cm

D. 4.2 cm

Q10 Mathematics

At present, the difference of the ages of a mother and son is 30 years. 15 years ago, the mother's age was twice the then age of the son. The present age (in years) of the mother is:

A. 75



B. 45

C. 60

D. 90

Q11 Mathematics

A shopkeeper offers a scheme of either selling articles at successive discounts of 30% and 20% or one where a customer can "buy 2, get 1 free". The positive difference in overall nominal percentage discounts offered in the two schemes is:

A. $10\frac{2}{3}\%$



B. $11\frac{2}{3}\%$

C. $10\frac{1}{3}\%$

D. $11\frac{1}{3}\%$

Q12 Mathematics

Train A leaves station M at 6.00 a.m. and reaches station N at 2.00 p.m. on the same day. Train B leaves station N at 8.00 a.m. and reaches station M at 3.00 p.m. on the same day. Find the time when Trains A and B meet.

A. 10.48 a.m.



B. 11.00 a.m.

C. 10.55 a.m.

D. 10.45 a.m.



Q13 Mathematics

The LCM of 62 and 30 is:

- A. 310
- B. 9300
- C. 930
- D. 1860



Q14 Mathematics

Which of the following is divisible by 4?

- A. 2122
- B. 2123
- C. 2124
- D. 2125



Q15 Mathematics

If $\frac{5}{2}$ is a root of the equation $4x^2 - mx + 25 = 0$, then the value of m is:

- A. 20
- B. 25
- C. 50
- D. 10



Q16 Mathematics

Which is the smallest fraction among the options given below?

- A. $\frac{1981}{150}$
- B. $\frac{1981}{153}$
- C. $\frac{1981}{152}$
- D. $\frac{1981}{155}$



Q17 Mathematics

Find the measure of each interior angle of a regular hexagon.

A. 135°

B. 45°

C. 80°

D. 120° ✓

Q18 Mathematics

Find the value of $(3 + 11) \times 4 \div (6 + 1) - 21$.

A. 15

B. -15

C. -13 ✓

D. 13

Q19 Mathematics

In a right-angled triangle ABC, right-angled at B, if $\tan A = \frac{1}{\sqrt{3}}$, the value of

$(\sin A \cos C + \cos A \sin C)$ is:

A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. $\frac{3}{4}$

D. 1 ✓

Q20 Mathematics

The volume of a right circular cylinder is 814 cm^3 . If the radius and the height of the cylinder are equal, find the height (in cm) of the cylinder.

(Use $\pi = \frac{22}{7}$)

A. $\sqrt[2]{259}$

B. $\sqrt[3]{259}$ ✓

C. $\sqrt[3]{295}$

D. $2\sqrt[3]{259}$



Q21 Mathematics

The LCM of two numbers is 14 times their HCF. If one of the numbers is 36 and the sum of the LCM and the HCF is 270, then the other number is:

A. 144

B. 126



C. 252

D. 234

Q22 Mathematics

The sum of a number and its reciprocal is -2 . Find the quadratic equation associated with the situation and also the number.

A. $x^2 + 2x + 1 = 0, x = -1$



B. $x^2 - 2x + 1 = 0, x = -1$

C. $x^2 + 2x + 1 = 0, x = 1$

D. $x^2 + 2x - 1 = 0, x = -1$

Q23 Mathematics

A and B can do a piece of work in 9 days and 12 days, respectively. A starts the work and they work on alternate days. They can finish the work in:

A. 11 days

B. $11\frac{1}{4}$ days

C. $10\frac{2}{7}$ days

D. $10\frac{1}{4}$ days

**Q24 Mathematics**

A sum of ₹150 is divided into two parts. The first part is ₹2 more than three times the second part. Find the second part.

A. ₹113

B. ₹37



C. ₹115

D. ₹35



If $48 : b :: b : 75$, and $b > 0$, find the value of b .

A. 55

B. 60



C. 65

D. 70



Mathematics

25 Questions • Answer Key

Q1 Mathematics

In 10 years A will be twice as old as B was 10 years ago. If A is 9 years older than B, then the present age of A is:

- A. 39 years
- B. 48 years
- C. 13 years
- D. $21\frac{1}{2}$ years



Q2 Mathematics

$\sqrt{8836} + \sqrt{6084} - \sqrt{1849}$ equals:

- A. 121
- B. 129
- C. 162
- D. 126



Q3 Mathematics

The difference between the ages of a father and son is 35 years. Five years from now the father's age would be double that of the son's age. What is the son's present age?

- A. 25 years
- B. 20 years
- C. 15 years
- D. 30 years



Q4 Mathematics

The value of $(x^{\frac{2}{3}} - x^{\frac{-2}{3}})(x^{\frac{4}{3}} + 1 + x^{\frac{-4}{3}})$ is _____.

- A. 0
- B. $\frac{1}{x^2}$
- C. x^2
- D. $x^2 - \frac{1}{x^2}$



Q5 Mathematics

If $a = (0.\overline{29} \div 0.3\overline{2}) \times (0.\overline{2} \div 0.\overline{15}) + 0.\overline{3}$, then the value of a is:

A. $1\frac{1}{3}$

B. $2\frac{1}{3}$

C. $1\frac{2}{3}$ ✓

D. $3\frac{2}{3}$

Q6 Mathematics

A and B are emptying pipes and C is a filling pipe. Pipes A and B can empty a full tank in 15 hours and 18 hours, respectively. When all three pipes are opened together, it takes $1\frac{1}{4}$ hours to empty $\frac{1}{9}$ part of the tank. In how many hours can pipe C alone fill $\frac{2}{3}$ part of the tank?

A. 18

B. 20 ✓

C. 25

D. 30

Q7 Mathematics

Aruna bought 8 bananas for ₹25 and sold 6 bananas for ₹20. What is her profit or loss percentage?

A. $6\frac{1}{3}\%$ loss

B. $6\frac{2}{3}\%$ profit ✓

C. $3\frac{2}{3}\%$ profit

D. $5\frac{2}{3}\%$ loss



Q8 Mathematics

MNOP is a quadrilateral in which each of its angles is a right angle. Side MN equals side PO and side MP equals side NO and its both diagonals do not intersect at 90° . What type of quadrilateral is MNOP?

- A. Kite
- B. Rhombus
- c. Square
- D. Rectangle

**Q9 Mathematics**

The median of the data 9, 12, 11, 8, 16, 18, 10, 14, 15, 13, 17, 20, 2, 24 is x . If 2 and 8 are replaced by 21 and 18 in this data, respectively, then the median of the data so obtained is y . What is the value of $(3x - y)$?

- A. 23.5
- B. 24.5
- C. 25
- D. 26

**Q10 Mathematics**

The LCM of two numbers is 20 times their HCF and their HCF is 213. If one of the two numbers is divided by 225, the quotient is 4 and the remainder is 165. The other number is:

- A. 426
- B. 639
- C. 852
- D. 1065

**Q11 Mathematics**

Pipe A can fill a tank in 8 hours. Pipes B and C can empty the full tank in 20 hours and 15 hours, respectively. Pipes A and B are opened together for 5 hours, and then B is closed, and C is opened instantly. The tank will be full in a total time of:

- A. $10\frac{5}{7}$ hours
- B. $11\frac{2}{7}$ hours
- c. $10\frac{3}{7}$ hours
- D. $15\frac{5}{7}$ hours



Q12 Mathematics

If $4a + 3b = 2c$, then find $(4a)^3 + (3b)^3 + (-2c)^3$.

A. $-72abc$



B. $72abc$

C. 0

D. 1

Q13 Mathematics

Let, $0.\overline{27} \div 3.\overline{2} = x$, where x is a proper fraction in the simplest form. Then the sum of the numerator and the denominator of x is:

A. 296

B. 340

C. 342

D. 346



Q14 Mathematics

Two numbers a and b are such that $a : 24 :: 24 : b$, and $a : b :: b : 192$. Find the value of $(a + b)$.

A. 48

B. 54

C. 60



D. 72

Q15 Mathematics

$\frac{3 - 4 \sin^2 \theta}{\cos^2 \theta}$ can be simplified as:

A. $3 - \tan^2 \theta$



B. $3 + \tan^2 \theta$

C. $3 \cot^2 \theta - \tan^2 \theta$

D. $3 \cos^2 \theta - 4 \sec^2 \theta$



Q16 Mathematics

A metallic sphere of radius 10.5 cm is melted and then recast into small spheres, each of radius 3.5 cm. Find the number of small spheres thus obtained.

A. 32

B. 30

C. 27



D. 72

Q17 Mathematics

If the interest earned during the 2nd year on a certain sum is ₹2,761, and the rate of interest is 10% per annum compounded annually, then the sum is:

A. ₹21,500

B. ₹26,100

C. ₹25,100



D. ₹25,150

Q18 Mathematics

Which of the numbers given below is divisible by 11?

A. 359247615447536920

B. 359247615447536915



C. 359247615447536923

D. 35924761544753698

Q19 Mathematics

A trader owes a merchant ₹12,500 due in one year. However, the trader wants to settle the amount after 6 months. If the rate of interest is 8% per annum, then how much money should he pay? (Give your answer correct to the nearest whole number value.)

A. ₹12,019



B. ₹10,219

C. ₹12,091

D. ₹10,291



Q20 Mathematics

If the mean and mode of a particular data are 12 and 21, respectively, then using empirical relation, find the median.

- A. 12
- B. 16
- C. 14
- D. 15

**Q21** Mathematics

A starts a business with ₹7,250 and after 3 months, B joins A as his partner. After a year since A started the business, the profit is divided between A and B in the ratio 8 : 9. What is B's contribution in the capital?

- A. ₹10,250
- B. ₹10,500
- C. ₹10,875
- D. ₹10,000

**Q22** Mathematics

Find the total surface area (in square units) of a hollow hemisphere whose outer radius is 10 units and inner radius is 5 units.

- A. 325π
- B. 225π
- C. 425π
- D. 375π

**Q23** Mathematics

The sum of the interior angles of a polygon with 200 sides is:

- A. $35,640^\circ$
- B. $35,460^\circ$
- C. $36,540^\circ$
- D. $35,604^\circ$



Q24 Mathematics

Find the quadratic equation whose roots are $\sqrt{3} + 1$ and $\sqrt{3} - 1$.

A. $x^2 - 2\sqrt{3}x + 4 = 0$

B. $x^2 - 2\sqrt{3}x + 2 = 0$ ✓

C. $x^2 + 2\sqrt{3}x + 2 = 0$

D. $x^2 - \sqrt{3}x + 2 = 0$

Q25 Mathematics

$x^4 - (x^2 - 2)^2 + (2 - x) = 0$ is:

A. a quadratic equation ✓

B. a linear equation

C. just a number

D. a bi-quadratic equation



Mathematics

25 Questions • Answer Key

Q1 Mathematics

If the surface area of a sphere is 1144 cm^2 , then find its diameter (in cm).

(Use $\pi = \frac{22}{7}$)

A. $2\sqrt{95}$

B. $\sqrt{91}$

C. $2\sqrt{91}$ ✓

D. 19

Q2 Mathematics

The area of a triangle is 81 cm^2 and its base is double the corresponding height. This height (in cm) of the triangle is:

A. 18

B. 9 ✓

C. 81

D. 10

Q3 Mathematics

The lengths of two sides of a triangle are 24 cm and 26 cm. Which of the following can be the measure of the third side?

A. 52 cm

B. 48 cm ✓

C. 55 cm

D. 54 cm

Q4 Mathematics

The difference between the compound interest and the simple interest, compounded annually, on a certain sum of money for 4 years at 8% per annum is ₹20. Find the sum. [Give your answer correct to 2 decimal places.]

A. ₹463.83

B. ₹473.83

C. ₹483.83

D. ₹493.96 ✓



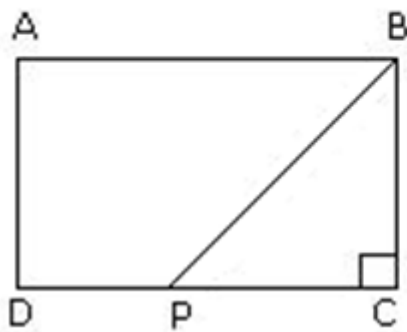
Q5 Mathematics

The sum of the ages of 4 boys born at intervals of 5 years each is 42 years. What is the age of the youngest boy?

- A. 6 years
- B. 5 years
- C. 4 years
- D. 3 years

**Q6 Mathematics**

Find the area of ABPD if $AB = DC = 4$ m, $AD = BC = 2.5$ m, and $PC = 1$ m.



- A. 6.25 m^2
- B. 8.75 m^2
- C. 7.85 m^2
- D. 9.00 m^2

**Q7 Mathematics**

A quadratic equation whose roots are m and n , is:

- A. $x^2 - (m - n)x + mn = 0$
- B. $x^2 - (m + n)x + mn = 0$
- C. $x^2 - (m + n)x - mn = 0$
- D. $x^2 + (m + n)x + mn = 0$



Q8 Mathematics

Raja is the father of Vikram. Raja is now 13 times as old as Vikram. After 10 years, Raja's then age will be 3 times the then age of Vikram. Find the present age (in years) of Vikram.

A. 4

B. 1

C. 2



D. 3

Q9 Mathematics

Find the value of $(6 \times 16 - 9 \div 3) + 17 - 12$.

A. 89

B. 98



C. 76

D. 67

Q10 Mathematics

The LCM and the HCF of two numbers, x and y , are 286 and 2, respectively. If the sum of these two numbers is 48, then the value of $\frac{1}{x} + \frac{1}{y}$ is:

A. $\frac{12}{143}$ B. $\frac{48}{571}$ C. $\frac{24}{167}$ D. $\frac{572}{48}$ **Q11 Mathematics**

A study centre has 5 classes with 50, 60, 25, 40 and 70 students. The pass percentage of these 5 classes are 20%, 25%, 20%, 10%, 30%, respectively. Find the average number of students per class in the centre who passed.

A. 11



B. 12

C. 10

D. 55



Q12 Mathematics

Arun bought 38 kg of rice for ₹1,710. He sold it at a profit equal to the selling price of 8 kg of it. What is the selling price of 5 kg of rice?

A. ₹280

B. ₹285



C. ₹290

D. ₹295

Q13 Mathematics

The value of $\frac{505}{\cot^2 \theta} - \frac{505}{\cos^2 \theta} + \frac{15 \tan \theta \cos \theta}{\sin \theta}$ is

A. 520

B. 490

C. -520

D. -490

**Q14 Mathematics**

677 NCC cadets wanted to participate in a parade. To participate in the said parade the cadets had to be arranged in a rectangular pattern where the number of rows is equal to the number of columns. What is the minimum number of NCC cadets who wanted to participate in the parade but had to be left out of the same?

A. 1



B. 2

C. 3

D. 4

Q15 Mathematics

If a milkman sells milk at ₹50 a litre, he loses ₹2,000. If he sells it at ₹60 a litre, he gains ₹1,500. The total quantity of milk (in litres) he sells is:

A. 350



B. 150

C. 200

D. 400



Q16 Mathematics

Ravi travels from City A to City B. If Ravi drives his car at two fifth of his normal speed, then he reaches City B 30 minutes late. Find the time (in minutes) that Ravi would have taken to travel from City A to City B if he drove at his normal speed.

A. 18

B. 15

C. 20



D. 22

Q17 Mathematics

Find the value of $3 \times 6 + 5 - 6 \div 2 - 9 + 72 \div (3 \times 4) + 42$.

A. 59



B. 149

C. 72

D. 85

Q18 Mathematics

Express $2.\overline{6}$ as an improper fraction.

A. $\frac{8}{3}$ B. $\frac{7}{3}$ C. $\frac{22}{9}$ D. $\frac{20}{9}$ **Q19** Mathematics

The sum of three distinct prime numbers is 40. What is the product of these prime numbers?

A. 310

B. 434



C. 682

D. 722



Q20 Mathematics

What is the sum of $7xy + 5yz - 3zx$, $4yz + 9zx - 4y$, $-3xy + 5x - 2xy$?

- A. $5x - 4y + 2xy + 9yz + 6zx$ ✓
- B. $5x - 4y + 6xy + 9yz - 6zx$
- C. $5x - 4y - 2xy - 9yz + 6zx$
- D. $5x - 4y + 6xy + 9yz + 6zx$

Q21 Mathematics

Simplify:

$$[65 + \{31 - (45 \text{ of } 3 \div 5)\} \times 4]$$

- A. 81 ✓
- B. 80
- C. 102
- D. 79

Q22 Mathematics

In $\triangle ABC$, $\overline{DE}$ is parallel to $\overline{BC}$, where D is a point on $\overline{AB}$ and E is a point on $\overline{AC}$, and $m(\overline{AD}) : m(\overline{DB})$ is 2 : 5. If $m(\overline{AC})$ is 8.4 cm, find $m(\overline{AE})$.

- A. 1.2 cm
- B. 1.4 cm
- C. 2.4 cm ✓
- D. 2.8 cm

Q23 Mathematics

If a number is divisible by 4, then which of the following statements is true?

- A. The sum of the digits in the number is divisible by 4.
- B. The number will be divisible by 2 and 6.
- C. The number formed by its last two digit is divisible by 4. ✓
- D. The unit place in the number is 0.



Q24 Mathematics

Kamal is now four times as old as his son now is. After 18 years his son will be half as old as Kamal would then be. Find the present age (in years) of the son.

A. 10

B. 24

C. 36

D. 9

**Q25** Mathematics

A man travelled a certain distance by bus at the rate of 40 km/h and returned walking at the rate of 5 km/h via the same route. If the two-way journey took him a total of 4 hours 30 minutes, the total distance covered by him in this 4.5 hour was:

A. 25 km

B. 20 km

C. 30 km

D. 40 km



Mathematics

25 Questions • Answer Key

Q1 Mathematics

$\sec \theta + \tan \theta = p$, then find $4 \sec \theta$.

A. $\frac{(1+p^2)}{p}$

B. $\frac{2(1+p^2)}{p}$ ✓

C. $\frac{(1+p^2)}{2p}$

D. $\frac{2(1-p^2)}{p}$

Q2 Mathematics

Factorise: $y^3 - xy^2 - x^2y + x^3$

A. $(y-x)^2(y-x)$

B. $(y-x)^2(y+x)$ ✓

C. $(y-x)(y^2+x^2)$

D. $(y+x)^2(y-x)$

Q3 Mathematics

$(x+2y-3z)^2$ is equal to:

A. $x^2 + 4y^2 - 9z^2 + 4xy - 12yz - 6xz$

B. $x^2 + 4y^2 + 9z^2 + 4xy - 12yz - 6xz$ ✓

C. $x^2 + 4y^2 + 9z^2 + 4xy + 12yz - 6xz$

D. $x^2 + 4y^2 + 9z^2 + 4xy - 12yz + 6yz$



Q4 Mathematics

The age of Raghu 8 years ago was thrice the then age of Mohan. Eight years hence, Raghu's age will be twice of Mohan's age. Find the ratio of the present ages of Mohan and Raghu, respectively.

A. 3 : 7



B. 4 : 5

C. 6 : 7

D. 3 : 5

Q5 Mathematics

Which of the options below represents a Pythagorean triplet?

A. 15, 224, 223

B. 12, 143, 150

C. 20, 99, 101



D. 10, 99, 111

Q6 Mathematics

If $ax^2 - 8x - 8$ is divided by $(x + 2)$, then the remainder is 24. Find the value of a .

A. 1

B. 4



C. 3

D. 2

Q7 Mathematics

Straight lines l and m are parallel to each other. Points A and B lie on the line l , points C and D lie on the line m , and E is a point that lies between the straight lines l and m , all in such a manner that $m\angle EAB = 50^\circ$ and $m\angle ECD = 70^\circ$. Find the measure of $\angle AEC$ if points A and C lie on the same side of point E.

A. 100°

B. 60°

C. 70°

D. 120°



Q8 Mathematics

There are three pipes A, B and C in a tank. The first pipe A can fill the empty tank in 8 hours, the second pipe B can fill the empty tank in 10 hours, and the third pipe C can empty the completely filled tank in 20 hours. If the three pipes are opened together when the tank is completely empty, then in how many hours will the tank be completely filled?

A. $\frac{30}{7}$ hours

B. $\frac{40}{7}$ hours



C. $\frac{20}{11}$ hours

D. $\frac{25}{11}$ hours

Q9 Mathematics

If the mean and the mode of a data set are 5 and 8, respectively, then, using the relevant empirical relation, find the median of the same data set.

A. 3.5

B. 7

C. 6



D. 14

Q10 Mathematics

The LCM of two numbers is 10 times their HCF and the sum of the LCM and the HCF is 451. If the sum of the numbers is 287, then one of the two numbers is:

A. 41

B. 82



C. 123

D. 164



Q11 Mathematics

The median of the following data is 28.5. The total frequency is 60. The values of x and y , respectively, are:

Age in years	0-10	10-20	20-30	30-40	40-50	50-60	Total
No. of patients	5	x	20	15	y	5	60

A. $x = 8, y = 7$



B. $x = 7, y = 8$

C. $x = 9, y = 6$

D. $x = 6, y = 9$

Q12 Mathematics

The perimeter of a regular pentagon whose each side is $2a$ cm long is:

A. $10a$ cm



B. $10a^2$ cm

C. $5a$ cm

D. $5a^5$ cm

Q13 Mathematics

The simple interest for 6 years, at a certain rate of interest per annum, is one-sixth of the principal. At the same rate of simple interest, what sum of money will amount to ₹6,000 total in 3 years?

[Give your answer correct to 2 decimal places.]

A. ₹5,538.46



B. ₹6,539.65

C. ₹5,565.39

D. ₹6,565.39



Q14 Mathematics

If the cost price of 63 articles is equal to the selling price of 54 articles, then what is the percentage gain or loss?

A. $16\frac{2}{3}\%$ loss

B. $16\frac{2}{3}\%$ gain



C. $15\frac{1}{3}\%$ loss

D. $15\frac{1}{3}\%$ gain

Q15 Mathematics

If 5 is subtracted from x , then the resulting number is exactly divisible by 18, 16, 24 and 32. The smallest value of x is:

A. 293



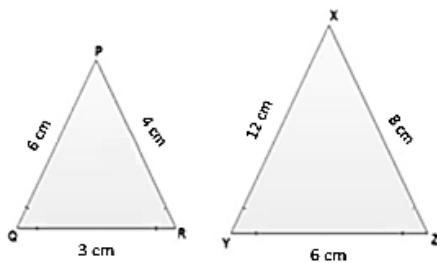
B. 283

C. 288

D. 581

Q16 Mathematics

In the given figures (figures drawn are not to scale), by which of the following similarity criteria $\triangle PQR$ is similar to $\triangle XYZ$, where S – side and A - Angle?



A. SSS



B. SAS

C. AAA

D. AAS



Q17 Mathematics

If 2 and 5 are the roots of a quadratic equation, then the quadratic equation is given by:

A. $x^2 + 7x + 10 = 0$

B. $2x^2 + 7x + 10 = 0$

C. $x^2 + 3x + 7 = 0$

D. $x^2 - 7x + 10 = 0$ ✓

Q18 Mathematics

There are three pipes K, L and M. Pipe K can fill a tank in 45 minutes and pipe L can fill the same tank in one hour. Pipe M can empty the same tank, when filled, in 1 hour 45 minutes. If all three pipes are opened together when the tank is empty, then the tank will be filled in:

A. $24\frac{3}{37}$ minutes

B. $34\frac{2}{37}$ minutes ✓

C. $44\frac{5}{37}$ minutes

D. $54\frac{9}{37}$ minutes

Q19 Mathematics

Two sides of a triangular field are 41 m and 28 m. If its perimeter is 84 m, then what is the length of the smallest altitude of the triangle? [Give your answer correct to two places of decimal.]

A. 7.15 m

B. 7.12 m

C. 6.12 m

D. 6.15 m ✓

Q20 Mathematics

During a sale, a trader allows a 25% cash discount followed by a 10% trade discount. If the list price of an item is ₹800, then its selling price is:

A. ₹280

B. ₹540 ✓

C. ₹275

D. ₹510



Q21 Mathematics

Find the smallest number from the options given below, by which 242 should be divided so as to make the quotient a perfect square.

A. 1

B. 4

C. 3

D. 2

**Q22** Mathematics

If the product of the ages of M and N is 486 years and the ratio of their ages is 3 : 2, what is the sum of their ages?

A. 45 years

B. 60 years

C. 65 years

D. 70 years

**Q23** Mathematics

Simplify the following.

$$(-2)^4 \div (-2)^6$$

A. -4

B. $-\frac{1}{4}$

C. 4

D. $\frac{1}{4}$ **Q24** Mathematics

The sum of the numerator and the denominator of a fraction is 13. If 6 is added to both the numerator and the denominator, then the fraction becomes $\frac{8}{17}$. Find the absolute difference between the numerator and the denominator of the given fraction.

A. 12

B. 8

C. 9

D. 10



Q25 Mathematics

The ratio of the income of A to that of B is $3 : 5$. The expenditure of A is $\frac{7}{12}$ of his income, and the expenditure of B is $\frac{8}{15}$ of his income. The positive difference between their expenditures is ₹14,300. Find A's income.

A. ₹78,000

B. ₹46,800



C. ₹16,800

D. ₹48,300



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Which of the following numbers is divisible by both 6 and 9?

A. 4256

B. 2156

C. 5186

D. 3186



Q2 Mathematics

If $x - y = 9$ and $xy = 16$, find the value of $x^2 + y^2$.

A. 113

B. 49

C. 32

D. 115



Q3 Mathematics

The ages of K and M are in the ratio of 7 : 5 and the sum of their ages is 72 years. What will be the ratio of the ages of K and M, in the mentioned order, after 9 years?

A. 9 : 8

B. 13 : 11

C. 12 : 9

D. 17 : 13



Q4 Mathematics

If $u - v = 4$ and $uv = 20$, then the value of $u^3 - v^3$ is:

A. 64

B. 224

C. 304

D. 176



Q5 Mathematics

A and B together can complete a piece of work in 5 days. They started working together but after 3 days, B left. If the work is completed after 3 more days, B alone could do the entire work in:

- A. 6.5 days
- B. 15 days
- C. 13 days
- D. 7.5 days

**Q6 Mathematics**

A and B have undertaken to do a piece of work for ₹800. A alone can do it in 6 days, while B alone can do it in 8 days. With the help of C, they can finish it in 3 days. What is the share (in ₹) of A in the total amount received for completing the work?

- A. 450
- B. 350
- C. 400
- D. 300

**Q7 Mathematics**

The average temperature on Monday, Tuesday and Wednesday was 32°C , and the average temperature on Sunday, Monday and Tuesday was 36°C . If the temperature on Sunday was 39°C , then find the temperature on Wednesday.

- A. 34°C
- B. 27°C
- C. 26°C
- D. 28°C

**Q8 Mathematics**

Which of the following statements is true?

- A. 1 is a prime number.
- B. All prime numbers except the number 2 are odd numbers.
- C. There are seven prime numbers between 1 and 20.
- D. If number x is prime, then number $x+1$ is always prime.



Q9 Mathematics

Kamal has two children, Vishnu and Deeksha. At present, Kamal is 3 times as old as Vishnu. Deeksha is 3 years younger than Vishnu. 3 years ago, the sum of the then ages of all three of them was 63 years. Find the present age (in years) of Kamal.

A. 20

B. 54

C. 46

D. 45 ☒**Q10 Mathematics**

Find the value of $7 \times 8 + 11 - (17 - 5)$.

A. 55 ☒

B. 45

C. 57

D. 47

Q11 Mathematics

The product of two consecutive odd numbers is 1155. Represent the situation in the form of a quadratic equation, if x is smaller of the two numbers.

A. $x^2 - 2x - 1155 = 0$ B. $x^2 + 2x + 1155 = 0$ C. $x^2 + 2x - 1155 = 0$ ☒D. $x^2 + x + 1155 = 0$ **Q12 Mathematics**

If $\cot\theta - \operatorname{cosec}\theta = -\frac{1}{3}$, find $\frac{(1+\cos\theta)}{\sin\theta}$.

A. 1

B. 2

C. 3 ☒

D. 4



Q13 Mathematics

Let n be the least number which when divided by 15, 18, 20 and 27, the remainder in each case is 3 and n is divisible by 53. What is the sum of the digits of n ?

- A. 9
- B. 10
- C. 12
- D. 13

**Q14** Mathematics

Goods are sold such that when 5% discount is allowed, a profit of 33% is made. By what percentage is the list price more than the cost price?

- A. 40%
- B. 30%
- C. 35%
- D. 25%

**Q15** Mathematics

Two numbers, whose LCM is 416 and HCF is 2, are in the ratio 13 : 16. Find the greater of these two numbers.

- A. 32
- B. 42
- C. 26
- D. 34

**Q16** Mathematics

The discriminant of the quadratic equation $bx^2 + cx + a = 0$; $b \neq 0$, is given by the expression:

- A. $b^2 - 4ac$
- B. $b^2 + 4ac$
- C. $a^2 - 4ab$
- D. $c^2 - 4ab$



Q17 Mathematics

If the volume of a sphere is $\frac{792}{7} \text{ cm}^3$, then find the radius of the sphere.

(Use $\pi = \frac{22}{7}$ for calculation)

A. 3 cm



B. 2 cm

C. 2.5 cm

D. 3.5 cm

Q18 Mathematics

If $x = 2$, then the value of $(-x)^2 \times (-x)^3$ is:

A. -32



B. 32

C. $(-2)^1$

D. $(-2)^6$

Q19 Mathematics

If the areas of two similar triangles are in the ratio 361:529. What would be the ratio of the corresponding sides?

A. 23:19

B. 19:23



C. 361:529

D. 15:23

Q20 Mathematics

The perimeter of a right-angled triangle is 80 cm. If the length of its hypotenuse is 34 cm, find the lengths of its other two sides.

A. 16 cm, 30 cm



B. 20 cm, 26 cm

C. 18 cm, 28 cm

D. 14 cm, 32 cm



Q21 Mathematics

Find the value of $18 \div \{(7 \text{ of } 3 - 12)\} \times 9 \times (11 - 7)$.

A. 27

B. 58

C. 64

D. 72

**Q22** Mathematics

Find the value of 'y' in the equation given below.

$$3\frac{1}{2} + 2\frac{5}{7} \times y - \frac{1}{2} \div 2 = 4\frac{1}{4}$$

A. $\frac{19}{7}$

B. 0

C. $\frac{7}{19}$



D. $\frac{7}{5}$

Q23 Mathematics

Find the volume of a sphere whose surface area is 5544 cm^2 .

A. 9261 cm^3

B. 10888 cm^3

C. 38808 cm^3



D. 96621 cm^3



Q24 Mathematics

A bank offers 7.5% compound interest per annum calculated on a half-yearly basis. A customer deposits ₹3,600 each on 1 January and 1 July of a year. At the end of the year, the amount he would have gained by way of interest is _____.
[Give your answer correct to 2 decimal places.]

A. ₹272.25

B. ₹405.06

C. ₹410.06



D. ₹415.06

Q25 Mathematics

The least value of x so that the number $478265475x + 25481459x$ is divisible by 8, is given by:

A. $x = 1$ B. $x = 3$ C. $x = 4$ D. $x = 2$ 

Mathematics

25 Questions • Answer Key

Q1 Mathematics

If the 13 - digit number 3458762341x98 is divisible by 11, then the value of x is _____.

A. 1

B. 4

C. 2



D. 7

Q2 Mathematics

The area of a trapezium is 160 cm^2 . If the lengths of the parallel sides are 20 cm and 12 cm, respectively, then the perpendicular distance (in cm) between the parallel sides is:

A. 10



B. 11

C. 12

D. 8

Q3 Mathematics

The diagonals of rhombus are 12 cm and 16 cm. The length of the side of rhombus is:

A. 10 cm



B. 8 cm

C. 16 cm

D. 12 cm

Q4 Mathematics

Simplify the following.

$$-2 - [3 - \{3 - (4 - 5)\}]$$

A. -2

B. -1



C. -3

D. 1



Q5 Mathematics

If a and b are the roots of the quadratic equation $(x - m)(x - n) = k$, then the roots of the equation $(x - a)(x - b) = -k$ are:

A. a, n

B. $a + 1, b + 1$

C. m, n



D. m, b

Q6 Mathematics

50 identical units are purchased at a total price of ₹550 and $\frac{1}{5}$ of these units are sold at a loss of 10%. Find the per unit selling price of the remaining units to gain 20% on the whole transaction.

A. ₹12.250

B. ₹13.650

C. ₹14.025



D. ₹15.175

Q7 Mathematics

Study the data set given below and find its mode, median and mean, in the order mentioned:

8, 9, 8, 5, 9, 8, 9, 7, 9

A. 9, 9, 9

B. 9, 8, 8



C. 8, 9, 8

D. 8, 9, 9

Q8 Mathematics

How many integers lie between 891^2 and 892^2 ?

A. 1782



B. 892

C. 1784

D. 900



Q9 Mathematics

Rajesh's daughter's age is $\frac{1}{3}$ of Rajesh's wife's age. Rajesh's wife's age is $\frac{3}{4}$ of Rajesh's age, and Rajesh's age is $\frac{3}{5}$ of Rajesh's father's age. Find the age of Rajesh's daughter if Rajesh's father's age is 60 years.

- A. 7 years
- B. 11 years
- C. 9 years
- D. 13 years

**Q10 Mathematics**

If $\triangle ABC$ and $\triangle DEF$ are similar and $AB = 6$ cm, $DE = 8$ cm, $EF = 10$ cm and $FD = 14$ cm, then the perimeter of $\triangle ABC$ is:

- A. 24 cm
- B. 20 cm
- C. 16 cm
- D. 14 cm

**Q11 Mathematics**

Simplify $\sqrt{\frac{1+\cos x}{1-\cos x}}$, $0^\circ < x < 90^\circ$.

- A. $\cot x + \operatorname{cosec} x$
- B. $\tan x + \operatorname{cosec} x$
- C. $\sec x + \tan x$
- D. $\cot x + \tan x$

**Q12 Mathematics**

What is the median of the data 8.1, 4.2, 6.8, 9.9, 7.5, 11.2, 10.8, 13.5?

- A. 8.7
- B. 9
- C. 8.1
- D. 9.9



Q13 Mathematics

Pipe P can fill a tank in 28 minutes and pipe Q can fill it in 35 minutes. If pipes P and Q are opened simultaneously when the tank is empty and pipe P is closed after 12 minutes, then how much more time will it take pipe Q to fill the remaining tank by itself?

- A. 12 minutes
- B. 16 minutes
- C. 14 minutes
- D. 8 minutes

**Q14** Mathematics

In a two-digit number, the digit in the tens' place is twice the digit in the units' place. If the digits are interchanged, then the number thus formed is 9 less than the original number. Find the original number.

- A. 21
- B. 42
- C. 63
- D. 12

**Q15** Mathematics

The HCF of two numbers is 47. If the product of the two numbers is 6627, then the larger number among these two numbers is:

- A. 94
- B. 235
- C. 141
- D. 188

**Q16** Mathematics

A man took a loan from a bank at the rate of 14% per annum simple interest. After 5 years he had to pay ₹7,000 as interest. Find the principal amount of the loan.

- A. ₹7,500
- B. ₹10,000
- C. ₹12,500
- D. ₹15,000



Q17 Mathematics

If $8 : 9 :: 24 : y$, then find the value of y .

A. 6

B. 12

C. 18

D. 27



Q18 Mathematics

Simplify $(x + 1)(x - 1)(x^2 + 1)$.

A. $x^4 - 1$



B. $x^4 + 1$

C. $x^2 - 1$

D. $x^4 + x^3 + x - 1$

Q19 Mathematics

Two successive discounts of 5% and 12% are offered on the sale of an article whose marked price is ₹1,500. The selling price of the article is:

A. ₹1,234

B. ₹1,254



C. ₹1,253

D. ₹1,264

Q20 Mathematics

The perimeter of a rhombus is 146 cm and one of its diagonals is 55 cm. Find the area of the rhombus.

A. 2460 cm^2

B. 2640 cm^2

C. 1320 cm^2



D. 1325 cm^2



Q21 Mathematics

Which of the following is a quadratic equation?

A. $(x + 1)^2 = (x - 1)^2$

B. $(x + 1)^2 = (x - 1)^3$

C. $(x + 1)^2 = 2(x - 1)$ ✓

D. $3x^2 + 2x + 5 = 8x + 3 + 3x^2$

Q22 Mathematics

Simplify the following.

$$\left(\frac{(xy^2z)^{-3}}{y^{-3}} \right)^2$$

A. $\frac{1}{x^6y^6z^6}$ ✓

B. $x^6y^6z^6$

C. $x^6y^{18}z^6$

D. $\frac{1}{x^6y^{18}z^6}$

Q23 Mathematics

The ratio of the numbers of ₹10 notes, ₹20 notes and ₹50 notes in a box is given as 3 : 5 : 7. The total amount of cash in the box is ₹3,360. Find the number of ₹20 notes in that box.

A. 45

B. 35 ✓

C. 25

D. 15



Q24 Mathematics

Pipe K can fill a water tank in 10 hours. Pipe K is opened alone when the water tank is empty. When half of the water tank is filled by pipe K, then 4 more identical pipes are opened. What will be the total time taken to fill the water tank?

- A. 6 hours
- B. 6 hours 45 minutes
- C. 7 hours 15 minutes
- D. 6 hours 15 minutes

Q25 Mathematics

If $u + v = -2$ and $u^2 + v^2 = 16$, then the value of $(u - v)^2$ is:

- A. 8
- B. 16
- C. 14
- D. 28



Mathematics

25 Questions • Answer Key

Q1 Mathematics

A capsule is in the shape of a sphere of diameter 3.5 mm. Find the amount of medicine required to fill the capsule (in mm^3). [Use $\pi = \frac{22}{7}$, and give your answer correct to 2 places of decimal.]

A. 22.41

B. 22.46

C. 22.42

D. 22.43

Q2 Mathematics

A sum of ₹7,250 is lent under simple interest at the beginning of a year at a certain rate of interest per annum. After 6 months, a sum of ₹3,625 more is lent under simple interest but at a rate that is twice the former. At the end of the year, ₹335 is earned as interest from both the loans taken together. What was the rate of interest per annum at which the initial ₹7,250 was lent? [Give your answer correct to 2 decimal places.]

A. 3.10%

B. 3.00%

C. 3.08%

D. 3.12%

Q3 Mathematics

Simplify the following.

$$(y^2x)^4 \times (y^2x)^{-4}, x \neq 0, y \neq 0.$$

A. $(y^2x)^8$

B. 1

C. $(y^2x)^{-16}$

D. 0



Q4 Mathematics

Simplify the following.

$$1\frac{1}{2} \times 22 + 10 \div 5 - 2 \times 8$$

A. $-\frac{613}{44}$

B. 17

C. 19



D. $-\frac{13}{2}$

Q5 Mathematics

The present age of Arun is $\frac{1}{3}$ of his uncle's age. After 5 years, the sum of their ages will be 86 years. The present age of Arun is:

A. 21 years

B. 23 years

C. 25 years

D. 19 years

**Q6 Mathematics**

If the sum of a number and its reciprocal is 7, then which of the options below can be such a number?

A. $\frac{3-7\sqrt{5}}{2}$

B. $\frac{3+7\sqrt{5}}{2}$

C. $\frac{7+3\sqrt{5}}{2}$



D. $\frac{-7+3\sqrt{5}}{2}$



Q7 Mathematics

10 women can do a piece of work in 8 days. 8 men can complete the same work in 12 days. What is the ratio of the amounts of work that can be done in a day by a man and a woman?

A. 3 : 2

B. 4 : 3

C. 2 : 1

D. 5 : 6

**Q8 Mathematics**

During a sale, a TV shop owner offers four different types of successive discounts for any consumer to choose from. Which of the following options will give the best possible price to the shop owner as a percentage of the marked price of an item?

A. 25% and 15%

B. 30% and 10%

C. 35% and 5%

D. 20% and 20%

**Q9 Mathematics**

Shyam and Sundar can do a piece of work in 16 days and 24 days, respectively. Shyam started the work alone and after 10 days Sundar joined him and the duo worked together till the completion of the work. What was the total time taken for the work to be completed?

A. $10\frac{3}{5}$ days

B. $12\frac{3}{5}$ days

C. $13\frac{3}{5}$ days



D. $15\frac{3}{5}$ days



Q10 Mathematics

The mean of the first 7 prime numbers is:

A. $\frac{75}{7}$

B. $\frac{58}{7}$ ✓

C. $\frac{50}{7}$

D. $\frac{63}{7}$

Q11 Mathematics

Ujwal has ₹5,250 in currency notes of denominations ₹50, ₹100 and ₹200. The number of notes of each denomination are equal. How many notes in total does Ujwal have?

A. 15

B. 30

C. 45 ✓

D. 60

Q12 Mathematics

If A is an acute angle, then $\frac{1 + \tan^2 A}{1 + \cot^2 A}$ is equal to:

A. $\tan^2 A$ ✓

B. $\sec^2 A$

C. $\sin^2 A$

D. $\cos^2 A$

Q13 Mathematics

If the HCF of 408 and 1032 is expressed as $516m - 252 \times 4$, then m is:

A. -2

B. 2 ✓

C. 6

D. -6



Q14 Mathematics

If the sum of two numbers is 25 and the product is 136, then the sum of their cubes is:

A. 4525

B. 4524

C. 5524

D. 5425

**Q15** Mathematics

Simplify the following.

$$1 - 2 \times \{[-2(2 + 3) \times 20] \div 2\}$$

A. 201



B. -50

C. $-\frac{1}{50}$

D. -200

Q16 Mathematics

If $144 : y :: y : 225$, and $y > 0$, find the value of y .

A. 120

B. 130

C. 180



D. 210

Q17 Mathematics

A dishonest merchant claims to sell his items at cost price, but gives 200 kg of an item instead of the 250 kg he charges for. What is his percentage of profit in this transaction?

A. 20%

B. 15%

C. 25%



D. 10%



Q18 Mathematics

If $x - \frac{1}{x} = 2$, then find the value of $x^4 + \frac{1}{x^4}$.

A. 36

B. 34

C. 16

D. 24

Q19 Mathematics

If $y : 196 :: 196 : 784$, then what is the value of y ?

A. 4

B. 7

C. 49

D. 16

Q20 Mathematics

If a transversal cuts two parallel lines, then which of the options below is necessarily true?

A. the adjacent angles formed are equal

B. the interior alternate angles are equal

C. the interior opposite angles on the same side of the transversal are equal

D. the vertically opposite angles are supplementary

Q21 Mathematics

The variable X takes values 3 and 7, with frequencies of K and $K - 2$, respectively. If the arithmetic mean of X is 4, then the value of K is:

A. 3

B. 5

C. 4

D. 6



Q22 Mathematics

3 solid hemispheres of radius 2 unit each are melted and recast into a single sphere. Find the radius (in given units) of the newly cast single sphere.

A. $\sqrt[3]{15}$

B. 3

C. $\sqrt[3]{10}$

D. $\sqrt[3]{12}$ ✓

Q23 Mathematics

The length of a rectangle is 5 cm more than its width. If the area of the rectangle is 215 cm^2 , then the equation to find the width (w) of the rectangle is:

A. $w^2 + 5w - 215 = 0$ ✓

B. $w^2 - 5w - 215 = 0$

C. $w^2 + 5w + 215 = 0$

D. $2w^2 + 5w - 215 = 0$

Q24 Mathematics

If a and b are two co-prime numbers, then their LCM is:

A. $a \times b$ ✓

B. $a + b$

C. $a - b$

D. $\frac{a - b}{a + b}$

Q25 Mathematics

The interior angles of an 8-sided polygon are in the ratio 1 : 3 : 4 : 6 : 7 : 11 : 13 : 15. Find the measure of the largest interior angle in this polygon.

A. 300°

B. 288°

C. 234°

D. 270° ✓



Mathematics

25 Questions • Answer Key

Q1 Mathematics

Simplify the given expression.

$$\frac{z(x^3 - y^3)}{x^2 + xy + y^2} + \frac{x(y^3 - z^3)}{y^2 + yz + z^2} + \frac{y(z^3 - x^3)}{z^2 + zx + x^2}$$

A. $x + y + z$

B. $x^2 + y^2 + z^2$

C. $x - y - z$

D. 0



Q2 Mathematics

The average weight of 4 persons increases by 3 kg when a person of 53 kg is replaced by a new person. The weight (in kg) of the new person is:

A. 62

B. 65

C. 67

D. 68



Q3 Mathematics

Two trains of equal length are running on parallel lines in the same direction at speeds of 46 km/h and 36 km/h. The faster train passes the slower train in 36 seconds. The relative speed of these two trains (in m/s) is:

A. $\frac{25}{9}$

B. $\frac{25}{18}$

C. $\frac{25}{8}$

D. $\frac{25}{7}$



Q4 Mathematics

If $1.345 + 13.45 + 0.1354 + 0.0596 = 11.453 - 0.543 + k$, then what is the value of k ?

A. 3.06

B. 3.28

C. 4.08



D. 4.48

Q5 Mathematics

The marked price of an article is ₹1,820 and its selling price is ₹1,420. Find the discount percentage. (Round the answer to the nearest whole number.)

A. 22%



B. 25%

C. 28%

D. 26%

Q6 Mathematics

A trader owes a merchant ₹9,000 due in one year. However, the trader wants to settle the amount after 4 months. If the rate of interest is 6% per annum, then, how much money should he pay? (Give your answer correct to the nearest whole number value.)

A. ₹8,686

B. ₹8,688

C. ₹8,654



D. ₹8,645

Q7 Mathematics

In $\triangle ABC$, $AD \perp BC$ at D , $BE \perp AC$ at E and AD and BE intersect at a point F (in the interior of the triangle). If $BF = AC$, then which of the following is correct?

A. $\triangle CAD \cong \triangle DBF$

B. $\triangle CAD \cong \triangle FBD$



C. $\triangle CAD \cong \triangle BFD$

D. $\triangle CAD \cong \triangle DFB$



Q8 Mathematics

Find area of a triangle whose base measures 126.4 cm and height 54.8 cm.

A. 3343.36 cm^2

B. 3463.36 cm^2 ✓

C. 6926.72 cm^2

D. 9267.72 cm^2

Q9 Mathematics

$\{40 \div (2^5 \div 4) \times 125\}$ equals:

A. 1000

B. 2000

C. 625 ✓

D. 225

Q10 Mathematics

A and B invest in a business in the ratio of 7 : 8 for same time. If 7% of the total profit goes to charity and A's share in profit is ₹12,600, then what is the total amount of profit earned? [Give your answer correct to 2 decimal places.]

A. ₹29,032.26 ✓

B. ₹28,032.25

C. ₹29,025.32

D. ₹28,025.32

Q11 Mathematics

Simplify the given expression.

$$\frac{x^2 + 3x - 10}{x^2 - 25} \times \frac{x^2 + 3x + 2}{x^2 - 4} \times \frac{x(x + 2)}{(x + 1)^2 + (x + 1)}$$

A. $\frac{x + 5}{x}$

B. $\frac{x}{x + 5}$

C. $\frac{x - 5}{x}$

D. $\frac{x}{x - 5}$ ✓



Q12 Mathematics

Find the smallest number, which when tripled, will leave the remainder as zero on being divided by 5, 15 and 35.

- A. 100
- B. 150
- C. 35
- D. 70

**Q13** Mathematics

$\cot\theta \left(\frac{1}{\operatorname{cosec}\theta - 1} + \frac{1}{\operatorname{cosec}\theta + 1} \right) \times (\sin\theta - \operatorname{cosec}\theta)(\cos\theta - \sec\theta)$, $0^\circ < \theta < 90^\circ$, is equal to:

- A. $\operatorname{cosec} \theta$
- B. $\sec \theta$
- C. $2 \sin \theta$
- D. $2 \cos \theta$

**Q14** Mathematics

3 men can complete a piece of work in 6 days while 6 women can do it in 5 days. In how many days can 5 women and 3 men complete it?

- A. 3 days
- B. 4 days
- C. 5 days
- D. 6 days

**Q15** Mathematics

Which of the following equations does NOT have real roots?

- A. $3x^2 - 5x + 2 = 0$
- B. $x^2 - 4x - 3 = 0$
- C. $x^2 - 7x + 5 = 0$
- D. $6x^2 - 14x + 9 = 0$



Q16 Mathematics

A sum of ₹5,000 is divided into two parts. One part is deposited in bank A at simple interest at 5% per annum, and the other part is deposited in bank B at simple interest at 10% per annum. If the total annual interest received is ₹325, then the money deposited in bank A was:

A. ₹1,500

B. ₹5,000

C. ₹3,500



D. ₹4,000

Q17 Mathematics

Simplify the given expression.

$$2(x^2 + y^2)^2 - 3xy(x^2 + y^2) - 2x^2y^2$$

A. $(2x^2 + 2y^2 + xy)(x^2 + y^2 - 2xy)$ B. $(2x^2 + 2y^2 - xy)(x^2 + y^2 - 2xy)$ C. $(x^2 + y^2 - xy)(2x^2 + 2y^2 - xy)$ D. $(x^2 + y^2 + xy)(2x^2 + 2y^2 + xy)$ **Q18** Mathematics

If $12600 = p^3 \times q^2 \times r^2 \times s^1$, where p, q, r and s are consecutive prime numbers in ascending order, then what is the value of $(3p + 2q - r + s)$?

A. 12

B. 13

C. 14



D. 17

Q19 Mathematics

The area of a triangle whose sides measures 10 cm, 12 cm and 14 cm is:

A. $32\sqrt{3} \text{ cm}^2$ B. $24\sqrt{6} \text{ cm}^2$ C. $30\sqrt{2} \text{ cm}^2$ D. $25\sqrt{5} \text{ cm}^2$ 

Q20 Mathematics

If $12 : 3 :: 8 : x$, then find the value of x .

A. 4

B. 2

C. 6

D. 1

Q21 Mathematics

A class consisting of 30 students took a competitive exam. 18 of these students got an average of 90 marks and the remaining students of this class got an average of 80 marks. What is the average score of the class as a whole?

A. 76

B. 86

C. 92

D. 82

Q22 Mathematics

If a and b are the roots of the equation $x^2 + 5x + 4 = 0$, then the value of $\frac{a^3 + b^3}{a^2 + b^2 - 4}$ is:

A. -4

B. -5

C. -6

D. -7

Q23 Mathematics

If the ratio of two exterior angles on the same side of a transversal line intersecting the two parallel lines is $7 : 5$, then how much more is the larger of these two exterior angles than the smaller one?

A. 30°

B. 45°

C. 60°

D. 75°



Q24 Mathematics

A tailor has 22 metres of cloth and he has to cut each metre of cloth into 5 pieces. How many pieces can he get from the 22 metres of cloth he has?

A. 11

B. 55

C. 110



D. 1110

Q25 Mathematics

The sum of two consecutive multiples of 8 is 56. The greater of these two multiples is:

A. 24

B. 42

C. 32



D. 23



Mathematics

25 Questions • Answer Key

Q1 Mathematics

The area of a triangle is 85 cm^2 and its base is 5 cm. Find the height of the triangle corresponding to this given base.

A. 34 cm



B. 24 cm

C. 17 cm

D. 51 cm

Q2 Mathematics

A sum was invested at a certain rate of simple interest per annum for 8 years. Had it been invested at a rate of simple interest per annum that is 8% higher than the rate at which the sum had been actually invested, it would have fetched ₹4,000 more as interest at the end of the 8-year period. What was the sum invested?

A. ₹6,250



B. ₹6,500

C. ₹6,750

D. ₹6,925

Q3 Mathematics

The roots of the quadratic equation $x^2 - 6x + 5 = 0$ are:

A. -5, -1

B. 3, 2

C. 5, 1



D. -3, -2

Q4 Mathematics

The average age of Yamuna and her daughter, Sathvika, is 21 years. The ratio of their ages is 5 : 2. Find the age of Sathvika.

A. 10 years

B. 15 years

C. 17 years

D. 12 years



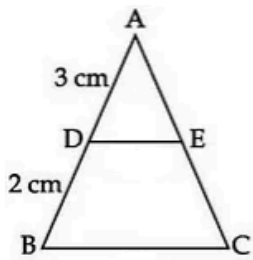
Q5 Mathematics

The HCF of 16, 20 and 24 is:

- A. 2
- B. 6
- C. 8
- D. 4



Q6 Mathematics



In the given figure, triangle ABC is similar to triangle ADE. If the area of triangle ADE = 18 cm^2 , then the area of triangle ABC is:

- A. 45 cm^2
- B. 90 cm^2
- C. 50 cm^2
- D. 55 cm^2



Q7 Mathematics

Observe the given pattern and find the missing number.

$$22^2 = 484$$

$$202^2 = 40804$$

$$2002^2 = 4008004$$

$$20002^2 = \dots\dots\dots$$

- A. 4840000
- B. 400800400
- C. 400080004
- D. 2000220002



Q8 Mathematics

If $K + \frac{1}{K} = -2$, then the value of $K^3 + \frac{1}{K^3}$ is:

A. -1

B. -2

C. -3

D. -4

**Q9** Mathematics

There is a 20% discount on a dozen pairs of identical shoes marked at a combined price of ₹7,200. How many such pairs of shoes can be bought for ₹1,440?

A. 5

B. 4

C. 3

D. 2

**Q10** Mathematics

Avinash's age is 5 times his son Aravind's age. Four years hence, the age of Avinash will be four times Aravind's age. Find the average of their present ages.

A. 36 years

B. 30 years

C. 24 years

D. 28 years



Q11 Mathematics

Simplify the following.

$$\frac{(3x^2)^5}{(6x^{-2})^2}$$

A. $\frac{81x^{14}}{36}$

B. $\frac{27x^6}{36}$

C. $\frac{27x^{14}}{4}$ ✓

D. $\frac{81x^6}{36}$

Q12 Mathematics

Mohan, Meena and Madhav enter into a partnership investing ₹3,000, ₹2,000 and ₹5,000 respectively. Find their respective shares in the annual profit of ₹5,600 in the given order of the names mentioned here.

A. ₹1,480, ₹1,320, ₹2,800

B. ₹1,680, ₹1,240, ₹2,680

C. ₹1,752, ₹1,168, ₹2,680

D. ₹1,680, ₹1,120, ₹2,800 ✓

Q13 Mathematics

While packing birthday caps for a party in packs of 8 or 10, one cap was always left out. How many caps were there if there were more than 250 but less than 300 caps in the lot?

A. 268

B. 275

C. 281 ✓

D. 261



Q14 Mathematics

In order to make the simplification problem given below correct, which of the pairs of signs given in the options needs to be interchanged?

$$25 \div 5 - 2 \times 30 + 3 = 10$$

A. $\div$ and $-$

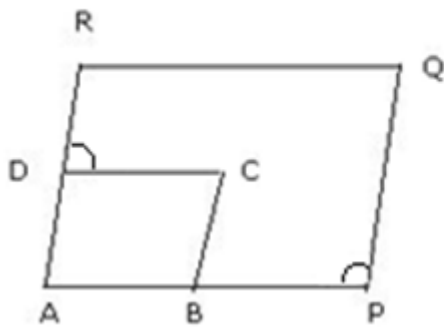
B. $\times$ and $-$

C. $\times$ and $+$

D. $\div$ and $+$

**Q15** Mathematics

In the given figure, ABCD and APQR are two parallelograms. If $\angle APQ = 100^\circ$, find $\angle CDR$.



A. 80°

B. 40°

C. 100°

D. 36°

**Q16** Mathematics

3 kg of apples and 4 kg of oranges cost ₹210, and 5 kg of apples and 2 kg of oranges cost ₹175. Find the cost of 1 kg of apples.

A. ₹37.5

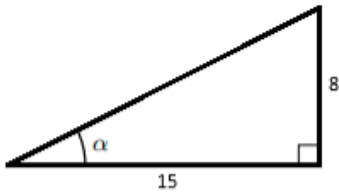
B. ₹35.7

C. ₹20

D. ₹25



Q17 Mathematics



In the given right-angled triangle, where the lengths of the sides given are in cm, find the value of $\cos \alpha + \cot \alpha$

A. $\frac{15}{17}$

B. $\frac{19}{8}$

C. $\frac{333}{136}$

D. $\frac{375}{136}$ ✓

Q18 Mathematics

If $i = \frac{7}{3}j$ and $j = \frac{4}{5}k$, then the ratio of $i : j : k$ is:

A. $28 : 4 : 15$

B. $7 : 12 : 5$

C. $28 : 12 : 15$ ✓

D. $21 : 12 : 20$

Q19 Mathematics

A pipe can fill an empty tank in 15 hours, but due to a leakage at the bottom, it is filled in 20 hours. If the tank is full, how long will the leakage take to empty it if no other entry or exit point in the tank is open?

A. 60 hours ✓

B. 40 hours

C. 50 hours

D. 30 hours



Q20 Mathematics

What is the discount percentage in the scheme of 'buy 5 get 3 free'?

A. 60%

B. 37.5%



C. 39.25%

D. 36.5%

Q21 Mathematics

Find the mode for the following data of student ages:

16, 17, 15, 17, 16, 15, 14, 14, 13, 17, 13, 12, 12, 16, 10, 14, 17, 10, 11.

A. 11

B. 16

C. 17



D. 15

Q22 Mathematics

If K is the mean of 2, 3, 4, K , then the mode is:

A. 1

B. 2

C. 3



D. 4

Q23 Mathematics

The base of the right-angled triangle is 3 m greater than its height. If its hypotenuse is 15 m, then find its area.

A. 54 m^2



B. 64 m^2

C. 72 m^2

D. 84 m^2



Q24 Mathematics

A and B can do a piece of work in 28 days and 35 days, respectively. They work on alternate days starting with A till the work gets completed. How long (in days) would it take A and B to complete the work?

A. 31



B. $31\frac{1}{9}$

C. $31\frac{1}{5}$

D. $31\frac{1}{2}$

Q25 Mathematics

If the length l of a room is reduced by 10% and breadth b is increased by 10%, then find the positive change in its perimeter.

A. $\frac{2}{5}(l - b)$

B. $\frac{2}{5}(l + b)$

C. $\frac{l+b}{5}$

D. $\frac{l-b}{5}$

