

YASASVI Mathematics

Sample Paper – 6

Duration: 45 Minutes

Maximum Marks: 120

Instructions

- This paper contains **30** Multiple Choice Questions (Single Correct Answer), modelled on the Mathematics portion of YASASVI entrance.
- Each correct answer carries **+4 marks**. There is **no negative marking** for incorrect or unattempted answers.
- Only **one** option is correct. Choose carefully.
- Syllabus level: **Class 8 NCERT — Number System, Algebra, Geometry, Mensuration, Data Handling**.
- Use of mobile phones, calculators, or electronic gadgets is strictly prohibited.

Q1. What is the product of $\frac{-3}{7}$ and $\frac{14}{9}$?

- (A) $\frac{2}{3}$
(B) $-\frac{6}{7}$
(C) $-\frac{2}{3}$
(D) $\frac{3}{2}$

Q2. Simplify: $(2^3)^2$

- (A) 12
(B) 32
(C) 48



(D) 64

Q3. Three bells ring at intervals of 4, 6, and 8 minutes. If they ring together at 9:00 am, when will they next ring together?

(A) 9:24 am

(B) 9:12 am

(C) 9:36 am

(D) 9:48 am

Q4. If $8 : x :: 4 : 7$, find x .

(A) 8

(B) 14

(C) 16

(D) 12

Q5. A shirt is marked at Rs 800 and sold at a 20% discount. Find the selling price.

(A) Rs 600

(B) Rs 620

(C) Rs 640

(D) Rs 660

Q6. A vendor buys 3 mangoes for Rs 5 and sells 5 mangoes for Rs 9. Find the profit percentage.

(A) 5%



- (B) 6%
- (C) 7%
- (D) 8%

Q7. A shopkeeper gives a 15% discount and still makes a 2% profit. If the cost price is Rs 500, find the marked price.

- (A) Rs 600
- (B) Rs 550
- (C) Rs 650
- (D) Rs 625

Q8. A person buys 2 items for a total of Rs 300. He sells the first item (bought at Rs 150) at a 20% profit. Find the selling price of the second item if it is sold at a 10% loss.

- (A) Rs 120
- (B) Rs 135
- (C) Rs 145
- (D) Rs 150

Q9. What principal will earn a simple interest of Rs 720 at 8% per annum in 3 years?

- (A) Rs 2,400
- (B) Rs 2,700
- (C) Rs 3,000
- (D) Rs 3,600



- Q10.** Find the compound interest on Rs 10,000 at 10% per annum compounded half-yearly for 1 year.
- (A) Rs 1,000
 - (B) Rs 1,020
 - (C) Rs 1,024
 - (D) Rs 1,025
- Q11.** The mean of 5 numbers is 18. Four of them are 14, 16, 20, and 22. Find the fifth number.
- (A) 18
 - (B) 16
 - (C) 20
 - (D) 15
- Q12.** A is twice as efficient as B. Together they finish a piece of work in 8 days. How long does B alone take to complete the work?
- (A) 16 days
 - (B) 24 days
 - (C) 32 days
 - (D) 12 days
- Q13.** 12 men can complete a work in 10 days. How many men are needed to complete the same work in 8 days?
- (A) 10



- (B) 18
- (C) 15
- (D) 20

Q14. Trains A and B start simultaneously from stations P and Q (280 km apart) towards each other at 60 km/h and 80 km/h respectively. After how long do they meet?

- (A) 1 hour
- (B) 1.5 hours
- (C) 2.5 hours
- (D) 2 hours

Q15. A boat travels at 12 km/h in still water. The current flows at 3 km/h. What is the boat's upstream speed?

- (A) 9 km/h
- (B) 15 km/h
- (C) 6 km/h
- (D) 12 km/h

Q16. Three times a number minus 5 equals twice the number plus 7. Find the number.

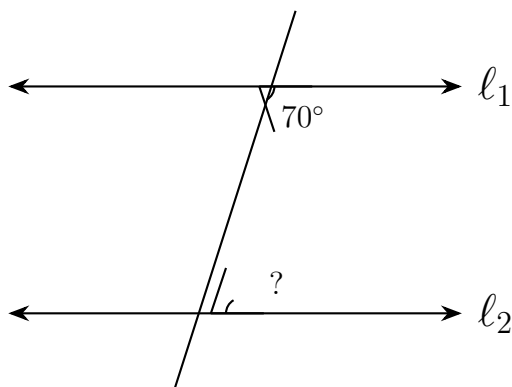
- (A) 10
- (B) 12
- (C) 15
- (D) 8



Q17. If $a + b = 7$ and $ab = 12$, find $a^2 + b^2$.

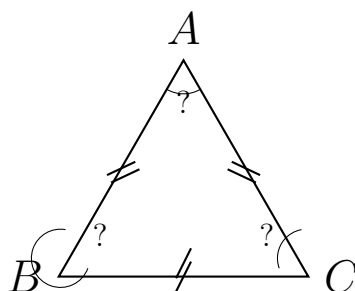
- (A) 37
- (B) 27
- (C) 25
- (D) 23

Q18. Two parallel lines are cut by a transversal. One co-interior (same-side interior) angle is 70° . Find the other co-interior angle.



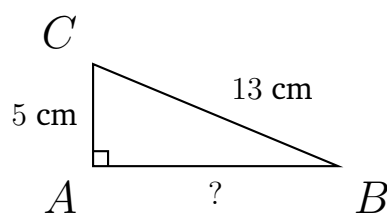
- (A) 70°
- (B) 90°
- (C) 120°
- (D) 110°

Q19. The figure shows an equilateral triangle. What is each interior angle?



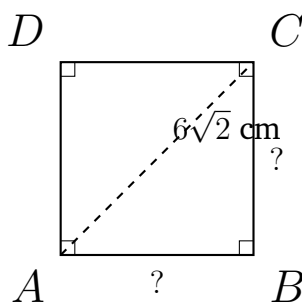
- (A) 60°
- (B) 45°
- (C) 90°
- (D) 30°

Q20. In the right triangle shown, the hypotenuse is 13 cm and one leg is 5 cm. Find the other leg.



- (A) 10 cm
- (B) 12 cm
- (C) 11 cm
- (D) 14 cm

Q21. The diagonal of a square is $6\sqrt{2}$ cm. Find the side of the square.

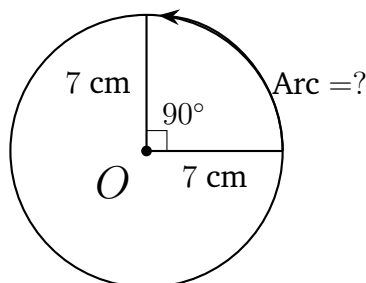


- (A) 4 cm
- (B) 5 cm
- (C) 6 cm



(D) 8 cm

Q22. Find the length of an arc of a circle with radius 7 cm subtending a central angle of 90° . (Use $\pi = \frac{22}{7}$)



(A) 7 cm

(B) 8 cm

(C) 10 cm

(D) 11 cm

Q23. Find the area of a parallelogram with base 9 cm and height 7 cm.

(A) 63 cm^2

(B) 56 cm^2

(C) 72 cm^2

(D) 48 cm^2

Q24. Find the volume of a cylinder with radius 7 cm and height 10 cm. (Use $\pi = \frac{22}{7}$)

(A) $1,320 \text{ cm}^3$

(B) $1,540 \text{ cm}^3$

(C) $1,760 \text{ cm}^3$



(D) $1,980 \text{ cm}^3$

Q25. The area of a circle is 154 cm^2 . Find its circumference. (Use $\pi = \frac{22}{7}$)

(A) 38 cm

(B) 42 cm

(C) 44 cm

(D) 48 cm

Q26. Find the range of the data set: 25, 42, 18, 55, 37, 12, 48.

(A) 37

(B) 40

(C) 42

(D) 43

Q27. A histogram shows: 0–10: 5 students, 10–20: 8 students, 20–30: 12 students, 30–40: 10 students. What is the total number of students?

(A) 35

(B) 30

(C) 40

(D) 45

Q28. A letter is picked at random from the word MATHEMATIC (10 letters: M, A, T, H, E, M, A, T, I, C). What is the probability of picking a vowel?



- (A) $\frac{1}{3}$
- (B) $\frac{2}{5}$
- (C) $\frac{3}{5}$
- (D) $\frac{1}{2}$

Q29. What is the sum of the first 10 odd natural numbers?

- (A) 90
- (B) 95
- (C) 100
- (D) 110

Q30. The ratio of a father's age to his son's age is 4 : 1. Five years later, the ratio becomes 3 : 1. Find the father's present age.

- (A) 30 years
- (B) 35 years
- (C) 38 years
- (D) 40 years



Detailed Solutions

Q1.

Solution

Multiply the two fractions directly:

$$\frac{-3}{7} \times \frac{14}{9} = \frac{-3 \times 14}{7 \times 9} = \frac{-42}{63}$$

Simplify by dividing numerator and denominator by 21:

$$\frac{-42}{63} = \frac{-2}{3}$$

The product is $-\frac{2}{3}$.

Answer: (C)

Q2.

Solution

Apply the power of a power rule: $(a^m)^n = a^{m \times n}$:

$$(2^3)^2 = 2^{3 \times 2} = 2^6 = 64$$

Answer: (D)

Q3.

Solution

The bells will next ring together after LCM(4, 6, 8) minutes.

Prime factorisations: $4 = 2^2$, $6 = 2 \times 3$, $8 = 2^3$

$$\text{LCM} = 2^3 \times 3 = 8 \times 3 = 24 \text{ minutes}$$

They next ring together 24 minutes after 9:00 am, i.e. at **9:24 am**.

Answer: (A)

Q4.

Solution

In a proportion $a : b :: c : d$, the product of means equals the product of extremes.

Given $8 : x :: 4 : 7$:

$$8 \times 7 = x \times 4$$



$$56 = 4x \implies x = \frac{56}{4} = 14$$

Answer: (B)

Q5.

Solution

$$\text{Discount} = 20\% \text{ of Rs } 800 = \frac{20}{100} \times 800 = \text{Rs } 160$$

$$\text{Selling Price} = \text{Marked Price} - \text{Discount} = 800 - 160 = \text{Rs } 640$$

$$\text{Alternatively: SP} = 800 \times (1 - 0.20) = 800 \times 0.80 = \text{Rs } 640.$$

Answer: (C)

Q6.

Solution

We compare CP and SP for the same quantity (5 mangoes):

$$\text{CP of 3 mangoes} = \text{Rs } 5, \text{ so CP of 5 mangoes} = \frac{5}{3} \times 5 = \frac{25}{3}$$

$$\text{SP of 5 mangoes} = \text{Rs } 9$$

$$\text{Profit\%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100 = \frac{9 - \frac{25}{3}}{\frac{25}{3}} \times 100 = \frac{\frac{27-25}{3}}{\frac{25}{3}} \times 100 = \frac{2}{25} \times 100 = 8\%$$

Answer: (D)

Q7.

Solution

Given: CP = Rs 500, discount = 15%, profit = 2%

$$\text{SP} = \text{CP} \times \left(1 + \frac{2}{100}\right) = 500 \times 1.02 = \text{Rs } 510$$

The SP after discount is 85% of the Marked Price:

$$\text{SP} = \text{MP} \times (1 - 0.15) \implies 510 = 0.85 \times \text{MP}$$

$$\text{MP} = \frac{510}{0.85} = \text{Rs } 600$$

Answer: (A)



Q8.

Solution

Total cost of 2 items = Rs 300, and first item cost = Rs 150, so second item cost = Rs 150.

SP of second item (sold at 10% loss):

$$SP_2 = 150 \times \left(1 - \frac{10}{100}\right) = 150 \times 0.90 = \text{Rs } 135$$

Answer: (B)

Q9.

Solution

Formula: $SI = \frac{P \times R \times T}{100}$, so $P = \frac{SI \times 100}{R \times T}$

$$P = \frac{720 \times 100}{8 \times 3} = \frac{72000}{24} = \text{Rs } 3,000$$

Answer: (C)

Q10.

Solution

Half-yearly compounding at 10% p.a.: rate per half-year = 5%, number of periods $n = 2$.

$$A = P \left(1 + \frac{R}{100}\right)^n = 10,000 \times (1.05)^2$$

$$(1.05)^2 = 1.1025$$

$$A = 10,000 \times 1.1025 = \text{Rs } 11,025$$

$$CI = A - P = 11,025 - 10,000 = \text{Rs } 1,025$$

Answer: (D)

Q11.

Solution

Sum of 5 numbers = $5 \times 18 = 90$

Sum of the four known numbers = $14 + 16 + 20 + 22 = 72$

Fifth number = $90 - 72 = 18$



Answer: (A)

Q12.

Solution

Let B's rate = $\frac{1}{t}$ (work per day). Since A is twice as efficient, A's rate = $\frac{2}{t}$.

Combined rate:

$$\frac{1}{t} + \frac{2}{t} = \frac{1}{8} \implies \frac{3}{t} = \frac{1}{8} \implies t = 24 \text{ days}$$

B alone takes 24 days.

Answer: (B)

Q13.

Solution

This is an inverse proportion problem (more men $\Rightarrow$ fewer days).

Total work = $12 \times 10 = 120$ man-days.

Men needed to finish in 8 days:

$$\text{Men} = \frac{120}{8} = 15$$

Answer: (C)

Q14.

Solution

When two trains move towards each other, their relative speed is the sum of their speeds.

Relative speed = $60 + 80 = 140$ km/h

$$\text{Time to meet} = \frac{\text{Distance}}{\text{Relative speed}} = \frac{280}{140} = 2 \text{ hours}$$

Answer: (D)

Q15.

Solution

Upstream speed = Speed in still water – Speed of current

$$\text{Upstream speed} = 12 - 3 = 9 \text{ km/h}$$

Answer: (A)

Q16.



Solution

Let the number be x . Translate the sentence into an equation:

$$3x - 5 = 2x + 7$$

$$3x - 2x = 7 + 5$$

$$x = 12$$

Answer: (B)

Q17.

Solution

Use the identity $(a + b)^2 = a^2 + 2ab + b^2$, so $a^2 + b^2 = (a + b)^2 - 2ab$:

$$a^2 + b^2 = (7)^2 - 2(12) = 49 - 24 = 25$$

Answer: (C)

Q18.

Solution

Co-interior angles (also called same-side interior angles or consecutive interior angles) formed when a transversal cuts two parallel lines are **supplementary** – they add up to 180° .

$$\text{Other co-interior angle} = 180^\circ - 70^\circ = 110^\circ$$

Answer: (D)

Q19.

Solution

An equilateral triangle has all three sides equal and all three interior angles equal.

By the angle sum property:

$$\angle A + \angle B + \angle C = 180^\circ \implies 3 \times \angle = 180^\circ \implies \angle = 60^\circ$$

Each interior angle of an equilateral triangle is 60° .

Answer: (A)

Q20.



Solution

Apply the Pythagorean theorem ($\text{hypotenuse}^2 = \text{leg}_1^2 + \text{leg}_2^2$):

$$13^2 = 5^2 + x^2$$

$$169 = 25 + x^2$$

$$x^2 = 144 \implies x = \sqrt{144} = 12 \text{ cm}$$

Answer: (B)

Q21.

Solution

For a square with side s , the diagonal $d = s\sqrt{2}$.

Given $d = 6\sqrt{2}$:

$$s\sqrt{2} = 6\sqrt{2} \implies s = 6 \text{ cm}$$

Alternatively: $s = \frac{d}{\sqrt{2}} = \frac{6\sqrt{2}}{\sqrt{2}} = 6 \text{ cm}.$

Answer: (C)

Q22.

Solution

$$\text{Arc length} = \frac{\theta}{360^\circ} \times 2\pi r$$

$$\text{Arc length} = \frac{90}{360} \times 2 \times \frac{22}{7} \times 7 = \frac{1}{4} \times 2 \times 22 = \frac{44}{4} = 11 \text{ cm}$$

Answer: (D)

Q23.

Solution

$$\text{Area of parallelogram} = \text{base} \times \text{height} = 9 \times 7 = 63 \text{ cm}^2$$

Answer: (A)

Q24.

Solution

$$\text{Volume of cylinder} = \pi r^2 h = \frac{22}{7} \times (7)^2 \times 10 = \frac{22}{7} \times 49 \times 10 = 22 \times 7 \times 10 = 1,540 \text{ cm}^3$$



Answer: (B)

Q25.

Solution

First, find the radius from the area:

$$\pi r^2 = 154 \Rightarrow \frac{22}{7} \times r^2 = 154 \Rightarrow r^2 = \frac{154 \times 7}{22} = \frac{1078}{22} = 49 \Rightarrow r = 7 \text{ cm}$$

Then find the circumference:

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 7 = 2 \times 22 = 44 \text{ cm}$$

Answer: (C)

Q26.

Solution

Range = Maximum value – Minimum value

Data: 25, 42, 18, 55, 37, 12, 48

Maximum = 55, Minimum = 12

$$\text{Range} = 55 - 12 = 43$$

Answer: (D)

Q27.

Solution

Total number of students = sum of frequencies of all class intervals:

$$5 + 8 + 12 + 10 = 35$$

Answer: (A)

Q28.

Solution

The word MATHEMATIC has 10 letters: M, A, T, H, E, M, A, T, I, C.

Vowels in MATHEMATIC: A, E, A, I $\Rightarrow$ 4 vowels.

$$P(\text{vowel}) = \frac{\text{Number of vowels}}{\text{Total letters}} = \frac{4}{10} = \frac{2}{5}$$

Answer: (B)

Q29.



Solution

The sum of the first n odd natural numbers equals n^2 .

For $n = 10$:

$$\text{Sum} = 10^2 = 100$$

Verification: $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 = 100 \checkmark$

Answer: (C)

Q30.

Solution

Let the son's present age = x years. Then the father's present age = $4x$ years.

Five years later: father's age = $4x + 5$, son's age = $x + 5$.

Given the new ratio is 3 : 1:

$$4x + 5 = 3(x + 5)$$

$$4x + 5 = 3x + 15$$

$$x = 10$$

Father's present age = $4 \times 10 = 40$ years.

Answer: (D)



Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	D	3	A	4	B	5	C
6	D	7	A	8	B	9	C	10	D
11	A	12	B	13	C	14	D	15	A
16	B	17	C	18	D	19	A	20	B
21	C	22	D	23	A	24	B	25	C
26	D	27	A	28	B	29	C	30	D

