YASASVI Mathematics

Sample Paper – 7

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 absolute value of $-\frac{7}{3}$?

(A) $-\frac{7}{3}$

(B) 7

(C) $\frac{3}{7}$

(D) $\frac{7}{3}$

Q2. Evaluate: $4^3 \div 2^5$.

(A) 2

(B) 4

(C) 8

(D) 16

Q3. Find the LCM of 9, 12, and 15.

(A) 60

(B) 180

(C) 90

(D) 120

Q4. Find the ratio compounded from $2 : 3$ and $4 : 5$.

(A) $6 : 8$

(B) $8 : 18$

(C) $8 : 15$

(D) $6 : 15$

Q5. A number is first increased by 20% and then decreased by 10%. What is the net percentage change?

(A) 10% increase

(B) 5% increase

(C) 9% increase

(D) 8% increase

Q6. A book is bought for Rs 180 and sold at a profit of 20%. Find the selling price.

(A) Rs 216

(B) Rs 200

(C) Rs 220

(D) Rs 210

Q7. A shopkeeper marks goods 40% above cost price and gives a 15% discount on the marked price. Find the profit percentage.

(A) 20%

(B) 19%

(C) 21%

(D) 25%

Q8. If a person makes a profit of Rs 75 by selling an article at Rs 675, find the cost price.

(A) Rs 575

(B) Rs 595

(C) Rs 600

(D) Rs 625

Q9. Rs 2,000 is invested at 6% simple interest per annum. What is the amount after 5 years?

(A) Rs 2,400

(B) Rs 2,500

(C) Rs 2,550

(D) Rs 2,600

Q10. A machine bought for Rs 20,000 depreciates at 10% per an-

num. Find its value after 2 years.

(A) Rs 16,200

(B) Rs 16,000

(C) Rs 15,800

(D) Rs 18,000

Q11. The average age of 4 friends is 15 years. A 5th friend aged 20 joins the group. What is the new average age?

(A) 15

(B) 16

(C) 17

(D) 18

Q12. 5 workers can build a wall in 12 days. How many days will 10 workers take to build the same wall?

(A) 4

(B) 5

(C) 6

(D) 8

Q13. A and B work alternately, A starting first. A can complete the work in 4 days and B in 12 days. How many days does it take to complete the work?

(A) 5 days

(B) 5.5 days

(C) 6.5 days

(D) 6 days

Q14. A person runs at 8 km/h for 45 minutes. How far does he run?

(A) 6 km

(B) 5 km

(C) 7 km

(D) 4.5 km

Q15. Two cyclists start from the same point. A rides at 20 km/h and B at 15 km/h in the same direction. How far apart are they after 3 hours?

(A) 12 km

(B) 15 km

(C) 18 km

(D) 10 km

Q16. If $2x + 3y = 12$ and $x - y = 1$, find the value of y.

(A) 1

(B) 3

(C) 2

(D) 4

Q17. If $p(x) = x^2 - 3x + 2$, find $p(3)$.

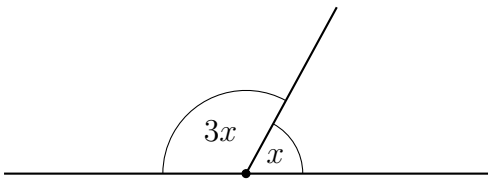
(A) 0

(B) 1

(C) 4

(D) 2

Q18. Two supplementary angles are in the ratio $1 : 3$. Find the smaller angle.



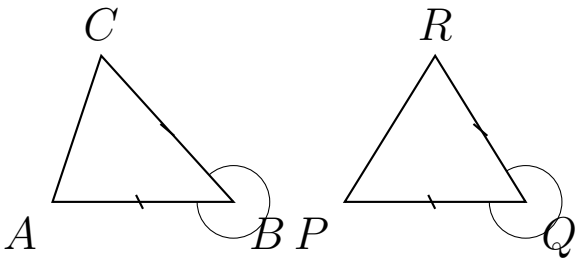
(A) $45°$

(B) $30°$

(C) $40°$

(D) $60°$

Q19. Two sides and the included angle of triangle ABC equal the corresponding parts of triangle PQR. Which congruence criterion applies?



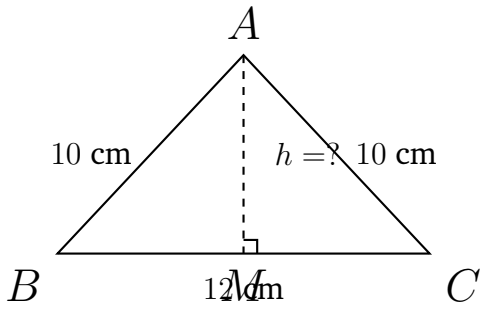
(A) ASA

(B) SAS

(C) SSS

(D) AAS

Q20. An isosceles triangle has equal sides of 10 cm each and a base of 12 cm. Find the height from the apex to the base.



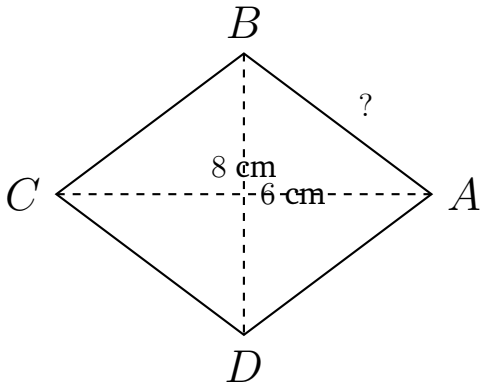
(A) 6 cm

(B) 9 cm

(C) 8 cm

(D) 10 cm

Q21. A rhombus has diagonals of 8 cm and 6 cm. Find the length of each side.



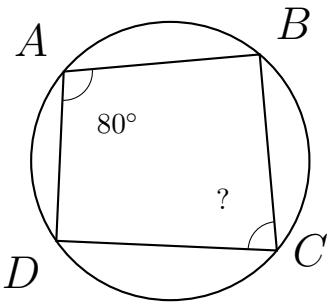
(A) 6 cm

(B) 7 cm

(C) 4 cm

(D) 5 cm

Q22. In a cyclic quadrilateral $ABCD$, $\angle A = 80°$. Find $\angle C$.



(A) 100°

(B) 80°

(C) 90°

(D) 120°

Q23. Find the area of a rhombus with diagonals 16 cm and 12 cm.

(A) 80 cm^2

(B) 96 cm^2

(C) 112 cm^2

(D) 192 cm^2

Q24. Find the volume of a cone with radius 7 cm and height 9 cm. $\left(\text{Use } \pi = \frac{22}{7}\right)$

(A) 396 cm^3

(B) 440 cm^3

(C) 462 cm^3

(D) 504 cm^3

Q25. The radii of two circles are in the ratio $3 : 4$. What is the ratio of their areas?

(A) $3 : 4$

(B) $6 : 8$

(C) $12 : 16$

(D) $9 : 16$

Q26. Find the mode of: $4,\ 5,\ 6,\ 4,\ 7,\ 5,\ 4,\ 8,\ 9,\ 4$.

(A) 4

(B) 5

(C) 6

(D) 7

Q27. In a survey, 25% of people prefer brand A. What is the sector angle for brand A in a pie chart?

(A) 75°

(B) 90°

(C) 60°

(D) 120°

Q28. Two dice are thrown simultaneously. What is the probability of getting a sum of 7?

(A) $\frac{1}{3}$

(B) $\frac{1}{4}$

(C) $\frac{1}{6}$

(D) $\frac{1}{12}$

Q29. What is the 8th triangular number?

(A) 28

(B) 32

(C) 34

(D) 36

Q30. A box contains Rs 3.60 in 50-paise and 10-paise coins. The total number of coins is 12. How many 50-paise coins are there?

(A) 6

(B) 5

(C) 4

(D) 8

Detailed Solutions

Q1.

Solution

The absolute value of a number is its distance from zero on the number line; it is always non-negative.

$$\left|-\frac{7}{3}\right| = \frac{7}{3}$$

The negative sign is removed, and the magnitude is retained.

Answer: (D)

Q2.

Solution

Express everything in terms of powers of 2:

$$4^3 \div 2^5 = (2^2)^3 \div 2^5 = 2^6 \div 2^5 = 2^{6-5} = 2^1 = 2$$

Alternatively: $4^3 = 64$ and $2^5 = 32$, so $64 \div 32 = 2$.

Answer: (A)

Q3.

Solution

Find the LCM of 9, 12, and 15 using prime factorisation:

$$9 = 3^2$$
$$12 = 2^2 \times 3^1$$
$$15 = 3^1 \times 5^1$$

Take the highest power of each prime factor:

$$\text{LCM} = 2^2 \times 3^2 \times 5 = 4 \times 9 \times 5 = 180$$

Answer: (B)

Q4.

Solution

The compound ratio of $a : b$ and $c : d$ is $(a \times c) : (b \times d)$.

$$\text{Compound ratio} = (2 \times 4) : (3 \times 5) = 8 : 15$$

Answer: (C)

Q5.

Solution

Let the original number be 100.

After a 20% increase: $100 \times 1.20 = 120$

After a 10% decrease on 120: $120 \times 0.90 = 108$

Net change $= 108 - 100 = 8$, so the net percentage change is:

$$\frac{8}{100} \times 100 = \mathbf{8\% \text{ increase}}$$

Answer: (D)

Q6.

Solution

Given: Cost Price $=$ Rs 180, Profit $= 20\%$

$$\text{SP} = \text{CP} \times \left(1 + \frac{\text{Profit}\%}{100}\right) = 180 \times \frac{120}{100} = 180 \times 1.20 = \text{Rs } 216$$

Answer: (A)

Q7.

Solution

Let CP $=$ Rs 100.

Marked Price $= 100 + 40\%$ of $100 =$ Rs 140

Discount $= 15\%$ of $140 =$ Rs 21

SP $= 140 - 21 =$ Rs 119

$$\text{Profit}\% = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100 = \frac{119 - 100}{100} \times 100 = 19\%$$

Answer: (B)

Q8.

Solution

$$\text{Cost Price} = \text{Selling Price} - \text{Profit} = 675 - 75 = \text{Rs } 600$$

Answer: (C)

Q9.

Solution

Formula for Simple Interest: $\text{SI} = \dfrac{P \times R \times T}{100}$

$$\text{SI} = \frac{2000 \times 6 \times 5}{100} = \frac{60000}{100} = \text{Rs } 600$$

$$\text{Amount} = P + \text{SI} = 2000 + 600 = \text{Rs } 2{,}600$$

Answer: (D)

Q10.

Solution

For depreciation, use: $\text{Value} = P \times \left(1 - \dfrac{R}{100}\right)^T$

$$\text{Value} = 20000 \times \left(1 - \frac{10}{100}\right)^2 = 20000 \times (0.9)^2 = 20000 \times 0.81 = \text{Rs } 16{,}200$$

Answer: (A)

Q11.

Solution

Total age of 4 friends $= 4 \times 15 = 60$ years.

After the 5th friend (aged 20) joins:

Total age $= 60 + 20 = 80$ years.

$$\text{New average} = \frac{80}{5} = 16 \text{ years}$$

Answer: (B)

Q12.

Solution

Total work $= 5 \times 12 = 60$ worker-days.

With 10 workers, using inverse proportion (more workers, fewer days):

$$\text{Days} = \frac{5 \times 12}{10} = \frac{60}{10} = 6 \text{ days}$$

Answer: (C)

Q13.

Solution

Rate of A $= \frac{1}{4}$ work/day; Rate of B $= \frac{1}{12}$ work/day.

They work alternately (A on odd days, B on even days). Work done in each 2-day cycle:

$$\frac{1}{4} + \frac{1}{12} = \frac{3}{12} + \frac{1}{12} = \frac{4}{12} = \frac{1}{3}$$

After 3 complete cycles (6 days): $3 \times \frac{1}{3} = 1$ (work complete).

The work is finished in exactly **6** days.

Answer: (D)

Q14.

Solution

Convert time: 45 min $= \frac{45}{60} = \frac{3}{4}$ hour.

$$\text{Distance} = \text{Speed} \times \text{Time} = 8 \times \frac{3}{4} = 6 \text{ km}$$

Answer: (A)

Q15.

Solution

When two objects move in the same direction, the relative speed equals the difference of their speeds.

Relative speed $= 20 - 15 = 5$ km/h.

$$\text{Distance apart after 3 hours} = 5 \times 3 = 15 \text{ km}$$

Answer: (B)

Q16.

Solution

From the second equation: $x = y + 1$.

Substitute into the first equation:

$$2(y + 1) + 3y = 12$$

$$2y + 2 + 3y = 12$$

$$5y = 10 \implies y = 2$$

Answer: (C)

Q17.

Solution

Substitute $x = 3$ into $p(x) = x^2 - 3x + 2$:

$$p(3) = (3)^2 - 3(3) + 2 = 9 - 9 + 2 = 2$$

Answer: (D)

Q18.

Solution

Supplementary angles sum to $180°$. Let the two angles be x and $3x$:

$$x + 3x = 180°$$

$$4x = 180° \implies x = 45°$$

The smaller angle is $x = \mathbf{45°}$.

Verification: $45° + 135° = 180°$. ✓

Answer: (A)

Q19.

Solution

The SAS (Side-Angle-Side) congruence criterion states that if two sides and the *included* angle of one triangle are equal to the corresponding two sides and included angle of another triangle, the triangles are congruent.

Since two sides and the **included** angle of $\triangle ABC$ equal the corresponding parts of $\triangle PQR$, the applicable criterion is **SAS**.

Answer: (B)

Q20.

Solution

The altitude from the apex bisects the base of an isosceles triangle. So each half of the base $= \dfrac{12}{2} = 6$ cm.

Using the Pythagorean theorem in the right triangle formed:

$$h = \sqrt{(\text{equal side})^2 - (\text{half base})^2} = \sqrt{10^2 - 6^2} = \sqrt{100 - 36} = \sqrt{64} = 8 \text{ cm}$$

Answer: (C)

Q21.

Solution

The diagonals of a rhombus bisect each other at right angles.

Half-diagonals: $\frac{8}{2} = 4$ cm and $\frac{6}{2} = 3$ cm.

Using the Pythagorean theorem, each side of the rhombus is:

$$\text{Side} = \sqrt{4^2 + 3^2} = \sqrt{16 + 9} = \sqrt{25} = 5 \text{ cm}$$

Answer: (D)

Q22.

Solution

A key property of cyclic quadrilaterals: opposite angles are supplementary (sum to $180°$).

$$\angle A + \angle C = 180°$$

$$80° + \angle C = 180°$$

$$\angle C = 180° - 80° = 100°$$

Answer: (A)

Q23.

Solution

$$\text{Area of rhombus} = \frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 16 \times 12 = 96 \text{ cm}^2$$

Answer: (B)

Q24.

Solution

$$\text{Volume of cone} = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times (7)^2 \times 9$$

$$= \frac{1}{3} \times \frac{22}{7} \times 49 \times 9 = \frac{1}{3} \times 22 \times 7 \times 9 = \frac{1}{3} \times 1386 = 462 \text{ cm}^3$$

Answer: (C)

Q25.

Solution

The area of a circle is proportional to the square of its radius: $A = \pi r^2$.

If the radii are in the ratio $r_1 : r_2 = 3 : 4$, then:

$$\frac{A_1}{A_2} = \frac{\pi r_1^2}{\pi r_2^2} = \left(\frac{r_1}{r_2}\right)^2 = \left(\frac{3}{4}\right)^2 = \frac{9}{16}$$

Ratio of areas $= 9 : 16$.

Answer: (D)

Solution

Q26. Count the frequency of each value in the data $\{4,\ 5,\ 6,\ 4,\ 7,\ 5,\ 4,\ 8,\ 9,\ 4\}$:

- 4 appears **4 times** (most frequent)
- 5 appears 2 times
- 6 appears 1 time
- 7 appears 1 time
- 8 appears 1 time
- 9 appears 1 time

The value with the highest frequency is **4**. Mode $= 4$.

Answer: (A)

Q27.

Solution

A full pie chart represents 360° for 100% of the data.

$$\text{Sector angle} = \frac{\text{Percentage}}{100} \times 360^\circ = \frac{25}{100} \times 360^\circ = \frac{1}{4} \times 360^\circ = 90^\circ$$

Answer: (B)

Q28.

Solution

Total outcomes when two dice are thrown $= 6 \times 6 = 36$.

Favourable outcomes (pairs summing to 7):

$$(1,6),\ (2,5),\ (3,4),\ (4,3),\ (5,2),\ (6,1) \quad \Rightarrow \quad 6 \text{ outcomes}$$

$$P(\text{sum} = 7) = \frac{6}{36} = \frac{1}{6}$$

Answer: (C)

Q29.

Solution

The n-th triangular number is given by the formula $T_n = \dfrac{n(n+1)}{2}$.

$$T_8 = \frac{8 \times (8+1)}{2} = \frac{8 \times 9}{2} = \frac{72}{2} = 36$$

Answer: (D)

Q30.

Solution

Let n = number of 50-paise coins. Then $(12 - n)$ = number of 10-paise coins.

Total value in rupees:

$$0.5n + 0.1(12 - n) = 3.60$$

$$0.5n + 1.2 - 0.1n = 3.60$$

$$0.4n = 2.40$$

$$n = 6$$

There are **6** coins of 50-paise.

Verification: $6 \times 0.5 + 6 \times 0.1 = 3.0 + 0.6 = \text{Rs } 3.60$. ✓

Answer: (A)

Answer Key

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