

YASASVI Mathematics

Sample Paper – 4

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. Arrange the following fractions in **descending** order: $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{9}$, $\frac{2}{3}$

- (A) $\frac{3}{4}$, $\frac{7}{9}$, $\frac{5}{6}$, $\frac{2}{3}$
- (B) $\frac{7}{9}$, $\frac{5}{6}$, $\frac{3}{4}$, $\frac{2}{3}$
- (C) $\frac{5}{6}$, $\frac{3}{4}$, $\frac{7}{9}$, $\frac{2}{3}$
- (D) $\frac{5}{6}$, $\frac{7}{9}$, $\frac{3}{4}$, $\frac{2}{3}$

Q2. If $2^x = 128$, find the value of x .

- (A) 7
- (B) 6



(C) 8

(D) 5

Q3. Two numbers have $\text{HCF} = 6$ and $\text{LCM} = 360$. If one of the numbers is 24, find the other number.

(A) 60

(B) 90

(C) 72

(D) 120

Q4. If $a : b = 3 : 4$ and $b : c = 5 : 6$, find the ratio $a : c$.

(A) 3 : 6

(B) 15 : 20

(C) 5 : 8

(D) 8 : 5

Q5. A population of 24,000 decreases by 15%. Find the new population.

(A) 20,000

(B) 19,600

(C) 21,000

(D) 20,400

Q6. An article is sold for **Rs 630** after a discount of 10% on its marked price. Find the marked price.



- (A) Rs 700
- (B) Rs 693
- (C) Rs 720
- (D) Rs 750

Q7. A trader marks his goods at 30% above cost price and then gives a discount of 10%. Find his profit percentage.

- (A) 20%
- (B) 17%
- (C) 13%
- (D) 15%

Q8. An article is bought for Rs 400. Two successive discounts of 20% and 10% are offered. What is the effective selling price?

- (A) Rs 280
- (B) Rs 320
- (C) Rs 288
- (D) Rs 300

Q9. Find the time period: Principal = Rs 3600, Rate = 12.5% per annum, Simple Interest = Rs 900.

- (A) 3 years
- (B) 1.5 years
- (C) 2.5 years



(D) 2 years

Q10. Find the Compound Interest when interest is compounded **half-yearly**: Principal = Rs 4000, Rate = 10% per annum, Time = 1 year.

(A) Rs 410

(B) Rs 400

(C) Rs 420

(D) Rs 441

Q11. A batsman's average score for 5 innings is 32. In the 6th innings he scores 44. What is his new average?

(A) 33

(B) 34

(C) 35

(D) 36

Q12. A and B together can complete a piece of work in 10 days. A alone can complete it in 15 days. How many days will B alone take to complete the same work?

(A) 20 days

(B) 25 days

(C) 30 days

(D) 35 days



- Q13.** 4 men or 6 women can do a piece of work in 20 days. In how many days can 2 men and 3 women together do the same work?
- (A) 10 days
(B) 12 days
(C) 15 days
(D) 20 days
- Q14.** A train 250 m long is moving at 54 km/h. How long does it take to cross another train 150 m long moving at 36 km/h in the **same direction**?
- (A) 80 seconds
(B) 40 seconds
(C) 60 seconds
(D) 100 seconds
- Q15.** A man rows at 5 km/h in still water. The river flows at 1 km/h. How long does it take him to row 12 km downstream?
- (A) 1.5 hours
(B) 2 hours
(C) 2.5 hours
(D) 3 hours



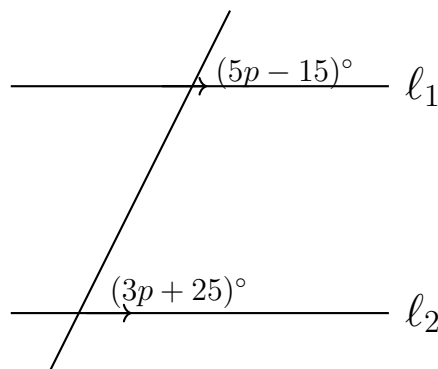
Q16. The sum of a positive integer and its square is 20. Find the integer.

- (A) 3
- (B) 5
- (C) 4
- (D) 2

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

- (A) 13
- (B) 49
- (C) 1
- (D) 25

Q18. In the figure, two parallel lines ℓ_1 and ℓ_2 are cut by a transversal. The corresponding angles are $(5p - 15)^\circ$ and $(3p + 25)^\circ$ as shown. Find the value of p .

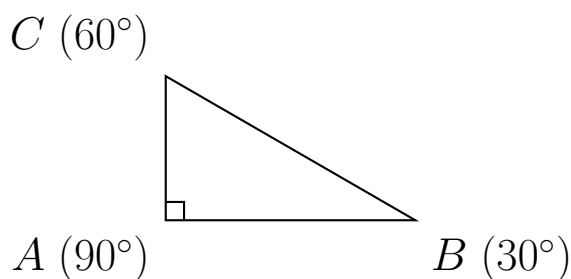


- (A) 20
- (B) 25
- (C) 15



(D) 10

Q19. The angles of a triangle are in the ratio 1 : 2 : 3. The triangle is right-angled. Find the smallest angle.



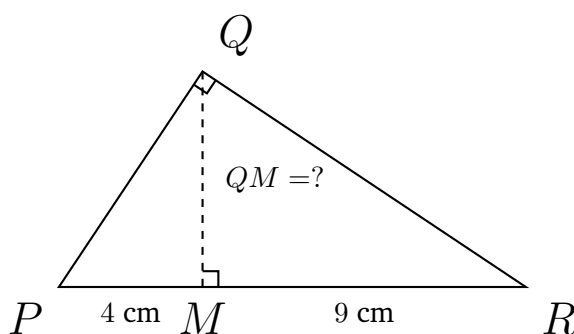
(A) 20°

(B) 30°

(C) 45°

(D) 60°

Q20. In right triangle PQR , the right angle is at Q . Altitude QM is drawn from Q to hypotenuse PR . If $PM = 4$ cm and $MR = 9$ cm, find QM .



(A) 3 cm

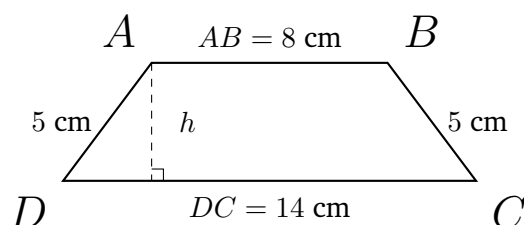
(B) 4 cm

(C) 6 cm



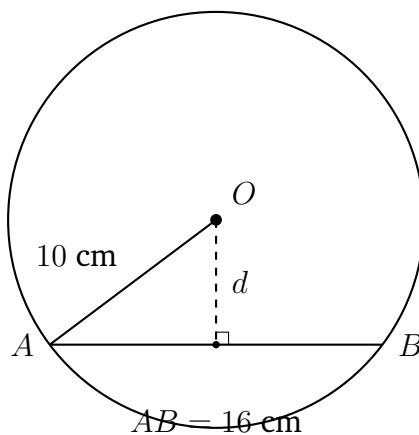
(D) 8 cm

- Q21.** In an isosceles trapezium $ABCD$, the parallel sides are $AB = 8$ cm (top) and $DC = 14$ cm (bottom). Each non-parallel side (leg) is 5 cm. Find the area of the trapezium.



- (A) 22 cm^2
(B) 33 cm^2
(C) 55 cm^2
(D) 44 cm^2

- Q22.** A chord AB is 16 cm long. The radius of the circle is 10 cm. Find the perpendicular distance from the centre O to the chord.



- (A) 6 cm
(B) 8 cm

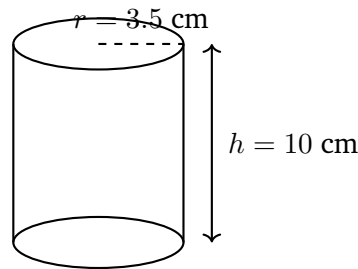


- (C) 4 cm
- (D) 12 cm

Q23. A square and a rectangle have equal perimeters. The square has a side of 12 cm and the rectangle has a length of 15 cm. Find the breadth of the rectangle.

- (A) 12 cm
- (B) 9 cm
- (C) 6 cm
- (D) 3 cm

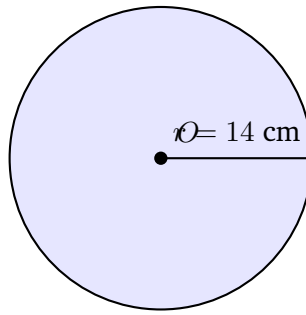
Q24. Find the Total Surface Area of a cylinder with radius $r = 3.5$ cm and height $h = 10$ cm. $\left(\text{Use } \pi = \frac{22}{7}\right)$



- (A) 280 cm^2
- (B) 308 cm^2
- (C) 297 cm^2
- (D) 314 cm^2

Q25. Find the area of a circle with radius $r = 14$ cm. $\left(\text{Use } \pi = \frac{22}{7}\right)$





- (A) 44 cm^2
- (B) 88 cm^2
- (C) 308 cm^2
- (D) 616 cm^2

Q26. Find the range of the following data: 42, 17, 83, 55, 26, 68.

- (A) 66
- (B) 41
- (C) 55
- (D) 68

Q27. In a double bar graph, Section A scored 60 marks and Section B scored 75 marks in Mathematics. By what percent is Section B's score more than Section A's score?

- (A) 20%
- (B) 25%
- (C) 15%
- (D) 30%

Q28. A card is drawn at random from cards numbered 1 to 20.



Find the probability that the number on the card is divisible by 3.

- (A) $\frac{1}{4}$
- (B) $\frac{1}{5}$
- (C) $\frac{3}{10}$
- (D) $\frac{2}{5}$

Q29. What is the unit digit of 7^{52} ?

- (A) 7
- (B) 9
- (C) 3
- (D) 1

Q30. A and B enter into a partnership. A invests Rs 5000 and B invests Rs 8000. At the end of the year, the total profit is Rs 2600. Find A 's share of the profit.

- (A) Rs 1000
- (B) Rs 1200
- (C) Rs 1600
- (D) Rs 1800



Detailed Solutions

Q1.

Solution

Convert all fractions to a common denominator. The LCM of 4, 6, 9, 3 is **36**.

$$\frac{3}{4} = \frac{27}{36}, \quad \frac{5}{6} = \frac{30}{36}, \quad \frac{7}{9} = \frac{28}{36}, \quad \frac{2}{3} = \frac{24}{36}$$

Comparing numerators in descending order: $30 > 28 > 27 > 24$.

Therefore the descending order is: $\frac{5}{6} > \frac{7}{9} > \frac{3}{4} > \frac{2}{3}$.

Answer: (D)

Q2.

Solution

Express 128 as a power of 2:

$$2^1 = 2, \quad 2^2 = 4, \quad 2^3 = 8, \quad 2^4 = 16, \quad 2^5 = 32, \quad 2^6 = 64, \quad 2^7 = 128$$

Therefore $2^x = 2^7$, giving $x = 7$.

Answer: (A)

Q3.

Solution

Using the standard property:

$$\text{HCF} \times \text{LCM} = \text{Product of the two numbers}$$

$$6 \times 360 = 24 \times \text{other number} \quad \Rightarrow \quad \text{Other number} = \frac{6 \times 360}{24} = \frac{2160}{24} = 90$$

Answer: (B)

Q4.

Solution

Given $a : b = 3 : 4$ and $b : c = 5 : 6$. Multiply the two ratios:

$$\frac{a}{c} = \frac{a}{b} \times \frac{b}{c} = \frac{3}{4} \times \frac{5}{6} = \frac{15}{24} = \frac{5}{8}$$

Therefore $a : c = 5 : 8$.

Answer: (C)

Q5.



Solution

A decrease of 15% means the new population is 85% of the original:

$$\text{New population} = 24000 \times \frac{85}{100} = 24000 \times 0.85 = \mathbf{20,400}$$

Answer: (D)

Q6.

Solution

Let Marked Price = MP. A 10% discount gives:

$$SP = MP \times \left(1 - \frac{10}{100}\right) = MP \times 0.9$$

$$630 = MP \times 0.9 \quad \Rightarrow \quad MP = \frac{630}{0.9} = \mathbf{Rs\ 700}$$

Answer: (A)

Q7.

Solution

Let CP = Rs 100.

Marked Price = $100 + 30\% \text{ of } 100 = \text{Rs } 130$.

After 10% discount: $SP = 130 \times \frac{90}{100} = \text{Rs } 117$.

$$\text{Profit} = 117 - 100 = \text{Rs } 17 \quad \Rightarrow \quad \text{Profit}\% = \frac{17}{100} \times 100 = \mathbf{17\%}$$

Answer: (B)

Q8.

Solution

Step 1: After first discount of 20%:

$$\text{Price}_1 = 400 \times \frac{80}{100} = \text{Rs } 320$$

Step 2: After second discount of 10% on Rs 320:

$$SP = 320 \times \frac{90}{100} = \mathbf{Rs\ 288}$$

Answer: (C)

Q9.



Solution

Using the formula $SI = \frac{P \times R \times T}{100}$, solve for T :

$$T = \frac{SI \times 100}{P \times R} = \frac{900 \times 100}{3600 \times 12.5} = \frac{90,000}{45,000} = 2 \text{ years}$$

Answer: (D)

Q10.

Solution

When compounded half-yearly: rate per period = $\frac{10}{2} = 5\%$; number of periods = $2 \times 1 = 2$.

$$A = P \times \left(1 + \frac{r}{100}\right)^n = 4000 \times (1.05)^2 = 4000 \times 1.1025 = \text{Rs } 4410$$

$$CI = A - P = 4410 - 4000 = \text{Rs } 410$$

Answer: (A)

Q11.

Solution

Total runs in 5 innings = $5 \times 32 = 160$.

After the 6th innings (score = 44): total runs = $160 + 44 = 204$.

$$\text{New average} = \frac{204}{6} = 34$$

Answer: (B)

Q12.

Solution

Work done by A per day = $\frac{1}{15}$.

Work done by $(A + B)$ per day = $\frac{1}{10}$.

Work done by B per day:

$$\frac{1}{10} - \frac{1}{15} = \frac{3}{30} - \frac{2}{30} = \frac{1}{30}$$

Therefore B alone takes 30 days.

Answer: (C)

Q13.



Solution

Since 4 men = 6 women, we have 1 man = 1.5 women.

2 men + 3 women = 2×1.5 women + 3 women = $3 + 3 = 6$ women.

Total work = 6 women $\times$ 20 days = 120 woman-days.

Time for 6 women to finish = $\frac{120}{6} = 20$ days.

Answer: (D)

Q14.

Solution

Relative speed of the two trains moving in the **same** direction:

$$= 54 - 36 = 18 \text{ km/h} = 18 \times \frac{1000}{3600} = 5 \text{ m/s}$$

Total length to be covered = $250 + 150 = 400$ m.

$$\text{Time} = \frac{400}{5} = 80 \text{ seconds}$$

Answer: (A)

Q15.

Solution

Downstream speed = speed of man + speed of river:

$$= 5 + 1 = 6 \text{ km/h}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{12}{6} = 2 \text{ hours}$$

Answer: (B)

Q16.

Solution

Let the positive integer be n . Then $n + n^2 = 20$:

$$n^2 + n - 20 = 0$$

Factorising: $(n + 5)(n - 4) = 0$, so $n = 4$ or $n = -5$.

Since n is a positive integer, $n = 4$.

Answer: (C)

Q17.



Solution

Using the algebraic identity $(a + b)^2 = a^2 + 2ab + b^2$:

$$7^2 = a^2 + b^2 + 2 \times 12$$

$$49 = a^2 + b^2 + 24 \quad \Rightarrow \quad a^2 + b^2 = 49 - 24 = 25$$

Answer: (D)

Q18.

Solution

Corresponding angles formed when a transversal cuts two parallel lines are **equal**:

$$5p - 15 = 3p + 25$$

$$5p - 3p = 25 + 15 \quad \Rightarrow \quad 2p = 40 \quad \Rightarrow \quad p = 20$$

Verification: $(5 \times 20 - 15)^\circ = 85^\circ$ and $(3 \times 20 + 25)^\circ = 85^\circ$. ✓

Answer: (A)

Q19.

Solution

Let the three angles be k , $2k$, $3k$. Their sum equals 180° :

$$k + 2k + 3k = 180^\circ \quad \Rightarrow \quad 6k = 180^\circ \quad \Rightarrow \quad k = 30^\circ$$

The three angles are 30° , 60° , 90° . (The 90° angle confirms it is right-angled.)

The smallest angle is 30° .

Answer: (B)

Q20.

Solution

By the **Altitude-on-Hypotenuse Theorem**: when an altitude is drawn from the right angle to the hypotenuse,

$$QM^2 = PM \times MR$$

$$QM^2 = 4 \times 9 = 36 \quad \Rightarrow \quad QM = \sqrt{36} = 6 \text{ cm}$$

Answer: (C)

Q21.



Solution

The longer base exceeds the shorter base by $14 - 8 = 6$ cm. Since the trapezium is isosceles, each leg overhangs by $\frac{6}{2} = 3$ cm.

Finding height h (right triangle with hypotenuse = leg = 5 cm, base = 3 cm):

$$h^2 + 3^2 = 5^2 \quad \Rightarrow \quad h^2 = 25 - 9 = 16 \quad \Rightarrow \quad h = 4 \text{ cm}$$

Area of trapezium:

$$= \frac{1}{2}(AB + DC) \times h = \frac{1}{2}(8 + 14) \times 4 = \frac{1}{2} \times 22 \times 4 = 44 \text{ cm}^2$$

Answer: (D)

Q22.

Solution

The perpendicular from the centre **bisects** the chord. Half the chord = $\frac{16}{2} = 8$ cm.

In the right triangle formed (perpendicular = d , half-chord = 8 cm, radius = 10 cm):

$$d^2 + 8^2 = 10^2 \quad \Rightarrow \quad d^2 = 100 - 64 = 36 \quad \Rightarrow \quad d = 6 \text{ cm}$$

Answer: (A)

Q23.

Solution

Perimeter of square = $4 \times 12 = 48$ cm.

Since the perimeters are equal, perimeter of rectangle = 48 cm:

$$2(l + b) = 48 \quad \Rightarrow \quad l + b = 24 \quad \Rightarrow \quad 15 + b = 24 \quad \Rightarrow \quad b = 9 \text{ cm}$$

Answer: (B)

Q24.

Solution

Total Surface Area (TSA) of a cylinder = $2\pi r(r + h)$:

$$\text{TSA} = 2 \times \frac{22}{7} \times 3.5 \times (3.5 + 10) = 2 \times \frac{22}{7} \times 3.5 \times 13.5$$

$$= 2 \times 22 \times \frac{3.5}{7} \times 13.5 = 2 \times 22 \times 0.5 \times 13.5 = 2 \times 11 \times 13.5 = 2 \times 148.5 = 297 \text{ cm}^2$$



Answer: (C)

Q25.

SolutionArea of a circle = πr^2 :

$$\text{Area} = \frac{22}{7} \times (14)^2 = \frac{22}{7} \times 196 = 22 \times 28 = 616 \text{ cm}^2$$

Answer: (D)

Solution

Range = Maximum value – Minimum value.

From the data {42, 17, 83, 55, 26, 68}:

- Q26.
- Maximum = 83
 - Minimum = 17

$$\text{Range} = 83 - 17 = 66$$

Answer: (A)

Q27.

Solution

Section B scored 75 marks; Section A scored 60 marks.

Excess of B over A = $75 - 60 = 15$ marks.

$$\text{Percentage more} = \frac{15}{60} \times 100 = \frac{1500}{60} = 25\%$$

Section B's score is 25% more than Section A's score.

Answer: (B)

Q28.

Solution

Numbers from 1 to 20 that are divisible by 3:

$$\{3, 6, 9, 12, 15, 18\} \longrightarrow 6 \text{ favourable outcomes}$$

Total outcomes = 20.

$$P(\text{divisible by 3}) = \frac{6}{20} = \frac{3}{10}$$

Answer: (C)

Q29.



Solution

The unit digits of successive powers of 7 follow a **cycle of length 4**:

$$7^1 \rightarrow 7, \quad 7^2 \rightarrow 9, \quad 7^3 \rightarrow 3, \quad 7^4 \rightarrow 1, \quad 7^5 \rightarrow 7, \quad \dots$$

For 7^{52} : divide the exponent by 4: $52 = 4 \times 13$, remainder = 0.

A remainder of 0 corresponds to the 4th position in the cycle, which has unit digit 1.

Answer: (D)

Q30.

Solution

A and B share profits in the ratio of their investments:

$$A : B = 5000 : 8000 = 5 : 8$$

Total parts = $5 + 8 = 13$.

$$A\text{'s share} = \frac{5}{13} \times 2600 = 5 \times 200 = \text{Rs } 1000$$

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

