

YASASVI Mathematics

Sample Paper – 2

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. Convert the recurring decimal $0.\overline{36}$ (i.e. $0.363636\dots$) to its simplest fractional form.

- (A) $\frac{3}{11}$
(B) $\frac{4}{11}$
(C) $\frac{36}{100}$
(D) $\frac{2}{5}$

Q2. Simplify: $(3^{-2} \times 3^5) \div 3^2$

- (A) 9
(B) $\frac{1}{3}$



(C) 3

(D) 27

Q3. Find the LCM of 12, 18, and 30.

(A) 60

(B) 90

(C) 120

(D) 180

Q4. Find the fourth proportional to 3, 7, and 9.

(A) 21

(B) 14

(C) 18

(D) 63

Q5. A shopkeeper increased the price of an item from Rs 600 to Rs 750. What is the percentage increase in price?

(A) 20%

(B) 25%

(C) 30%

(D) 15%

Q6. A trader sells goods at Rs 720 and incurs a loss of 10%. Find the cost price of the goods.

(A) Rs 750



- (B) Rs 792
- (C) Rs 800
- (D) Rs 810

Q7. A shopkeeper marks goods at 25% above cost price and then gives a 10% discount on the marked price. Find the profit percentage.

- (A) 10%
- (B) 15%
- (C) 10.5%
- (D) 12.5%

Q8. The cost price of 12 articles is equal to the selling price of 10 articles. Find the profit percentage.

- (A) 20%
- (B) 16.67%
- (C) 25%
- (D) 10%

Q9. Find the rate of interest per annum if a principal of Rs 4000 earns a simple interest of Rs 1200 in 3 years.

- (A) 8%
- (B) 10%
- (C) 12%
- (D) 9%



- Q10.** Find the amount after 3 years if Rs 5000 is invested at 4% per annum compounded annually.
- (A) Rs 5600.00
(B) Rs 5612.00
(C) Rs 5624.32
(D) Rs 5640.00
- Q11.** The average of 5 numbers is 32. One number, 28, is replaced by 48. What is the new average?
- (A) 34
(B) 33
(C) 35
(D) 36
- Q12.** A, B, and C can complete a piece of work alone in 6, 8, and 12 days respectively. In how many days will they complete it working together?
- (A) $\frac{8}{3}$ days
(B) 3 days
(C) $\frac{10}{3}$ days
(D) $\frac{7}{3}$ days
- Q13.** 6 men or 8 women can complete a work in 10 days. In how many days can 3 men and 4 women together complete the same work?



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

Q14. Two persons start walking towards each other from two towns 140 km apart, at speeds of 30 km/h and 40 km/h respectively. After how many hours do they meet?

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

Q15. A boat travels 24 km upstream in 6 hours and 24 km downstream in 4 hours. Find the speed of the current.

- (A) 2 km/h
- (B) 3 km/h
- (C) 5 km/h
- (D) 1 km/h

Q16. The sum of three consecutive even integers is 54. Find the middle integer.

- (A) 18
- (B) 16
- (C) 20



(D) 22

Q17. Expand and simplify: $(3a - 2b)^2$

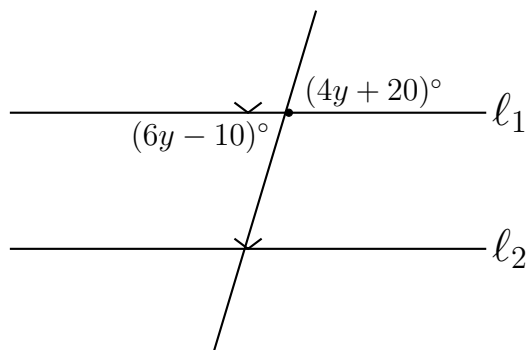
(A) $9a^2 + 12ab + 4b^2$

(B) $9a^2 - 12ab + 4b^2$

(C) $9a^2 - 4b^2$

(D) $9a^2 + 4b^2$

Q18. In the figure below, $\ell_1 \parallel \ell_2$ and a transversal cuts ℓ_1 . Two vertically opposite angles at the intersection on ℓ_1 are $(4y + 20)^\circ$ and $(6y - 10)^\circ$. Find the measure of each angle.



(A) 70°

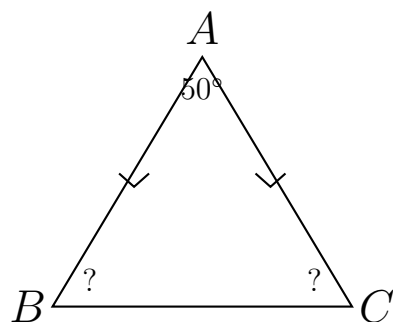
(B) 75°

(C) 80°

(D) 85°

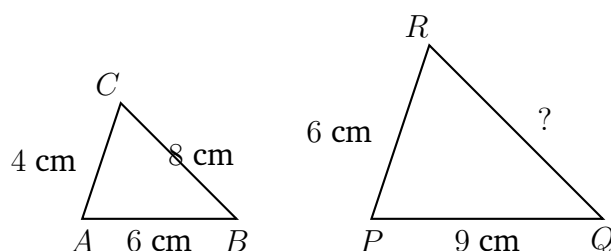
Q19. In triangle ABC , $AB = AC$ and $\angle A = 50^\circ$. Find the measure of $\angle B$.





- (A) 50°
- (B) 60°
- (C) 70°
- (D) 65°

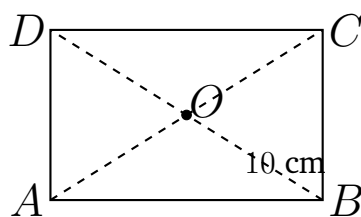
Q20. Two triangles are similar. The sides of the first triangle are 4 cm, 6 cm, and 8 cm. The shortest side of the second triangle is 6 cm. Find the longest side of the second triangle.



- (A) 12 cm
- (B) 10 cm
- (C) 9 cm
- (D) 8 cm

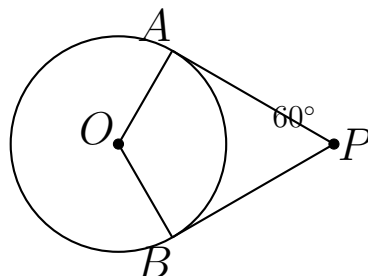
Q21. The diagonals of a rectangle $ABCD$ are each 10 cm long and bisect each other at point O . Find the distance from O to a vertex.





- (A) 10 cm
- (B) 5 cm
- (C) 7 cm
- (D) 8 cm

Q22. Two tangents are drawn from an external point P to a circle with centre O . The angle between the two tangents ($\angle APB$) is 60° . Find the angle $\angle AOB$ between the two radii drawn to the points of tangency.



- (A) 60°
- (B) 90°
- (C) 120°
- (D) 150°

Q23. Find the area of a triangle with base 14 cm and height 9 cm.

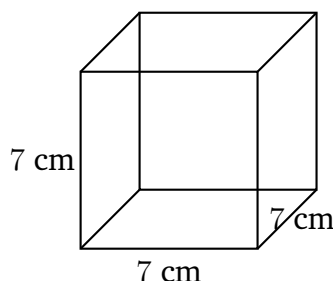
- (A) 49 cm^2
- (B) 56 cm^2



(C) 72 cm^2

(D) 63 cm^2

Q24. Find the total surface area of a cube with edge length 7 cm.



(A) 294 cm^2

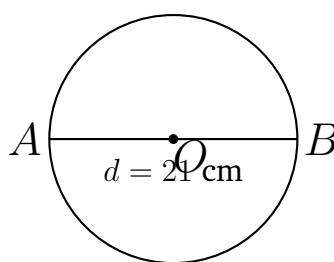
(B) 343 cm^2

(C) 196 cm^2

(D) 168 cm^2

Q25. Find the circumference of a circle whose diameter is 21 cm.

(Use $\pi = \frac{22}{7}$)



(A) 44 cm

(B) 66 cm

(C) 33 cm

(D) 132 cm



Q26. Find the mode of the following data set:

3, 5, 7, 5, 8, 3, 5, 9, 3, 5

- (A) 3
- (B) 7
- (C) 5
- (D) 9

Q27. In a pie chart representing subjects studied by students, the sector for **Science** has a central angle of 72° . What percentage of students study Science?

- (A) 10%
- (B) 15%
- (C) 25%
- (D) 20%

Q28. A fair six-sided die is rolled once. Find the probability of getting a number **greater than 4**.

- (A) $\frac{1}{3}$
- (B) $\frac{1}{2}$
- (C) $\frac{1}{6}$
- (D) $\frac{2}{3}$

Q29. What is the square root of 2025?

- (A) 40



- (B) 45
- (C) 50
- (D) 35

Q30. Ravi is currently 3 times as old as Sita. Five years later, Ravi will be twice Sita's age. Find Ravi's current age.

- (A) 10 years
- (B) 12 years
- (C) 15 years
- (D) 18 years



Detailed Solutions

Q1.

Solution

Let $x = 0.\overline{36} = 0.363636 \dots$

Multiply both sides by 100:

$$100x = 36.363636 \dots$$

Subtract the original equation:

$$100x - x = 36 \implies 99x = 36 \implies x = \frac{36}{99} = \frac{4}{11}$$

The recurring decimal $0.\overline{36} = \frac{4}{11}$.

Answer: (B)

Q2.

Solution

Apply the laws of exponents ($a^m \times a^n = a^{m+n}$ and $a^m \div a^n = a^{m-n}$):

$$(3^{-2} \times 3^5) \div 3^2 = 3^{-2+5} \div 3^2 = 3^3 \div 3^2 = 3^{3-2} = 3^1 = 3$$

Answer: (C)

Q3.

Solution

Find LCM of 12, 18, and 30 using prime factorisation:

$$12 = 2^2 \times 3^1$$

$$18 = 2^1 \times 3^2$$

$$30 = 2^1 \times 3^1 \times 5^1$$

Take the highest power of each prime factor:

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

Answer: (D)

Q4.



Solution

If $a : b = c : d$, then the fourth proportional is $d = \frac{b \times c}{a}$.

Here $a = 3, b = 7, c = 9$:

$$d = \frac{7 \times 9}{3} = \frac{63}{3} = 21$$

Answer: (A)

Q5.

Solution

$$\text{Percentage increase} = \frac{\text{Increase}}{\text{Original Price}} \times 100$$

$$\text{Increase} = 750 - 600 = \text{Rs } 150$$

$$\text{Percentage increase} = \frac{150}{600} \times 100 = \frac{1}{4} \times 100 = 25\%$$

Answer: (B)

Q6.

Solution

Given: SP = Rs 720, Loss = 10%

A loss of 10% means the SP is 90% of the CP:

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

$$CP = \frac{720}{0.9} = \frac{7200}{9} = \text{Rs } 800$$

Answer: (C)

Q7.

Solution

Let CP = Rs 100.

Marked Price (MP) = $100 + 25\%$ of 100 = Rs 125

Discount on MP = 10% of 125 = Rs 12.50

SP = $125 - 12.50$ = Rs 112.50

$$\text{Profit\%} = \frac{SP - CP}{CP} \times 100 = \frac{112.50 - 100}{100} \times 100 = 12.5\%$$



Answer: (D)

Q8.

Solution

Let CP per article = Re 1.

CP of 12 articles = Rs 12.

Given: CP of 12 articles = SP of 10 articles, so SP of 10 articles = Rs 12.

SP per article = $\frac{12}{10}$ = Rs 1.20Profit per article = $1.20 - 1.00$ = Rs 0.20

$$\text{Profit\%} = \frac{0.20}{1.00} \times 100 = 20\%$$

Answer: (A)

Q9.

SolutionFormula: $R = \frac{SI \times 100}{P \times T}$

$$R = \frac{1200 \times 100}{4000 \times 3} = \frac{120000}{12000} = 10\%$$

Answer: (B)

Q10.

SolutionFormula: $A = P \left(1 + \frac{R}{100} \right)^T$

$$A = 5000 \times \left(1 + \frac{4}{100} \right)^3 = 5000 \times (1.04)^3$$

$$(1.04)^2 = 1.0816; \quad (1.04)^3 = 1.0816 \times 1.04 = 1.124864$$

$$A = 5000 \times 1.124864 = \text{Rs } 5624.32$$

Answer: (C)

Q11.

SolutionOld sum = $5 \times 32 = 160$ New sum = $160 - 28 + 48 = 180$ 

$$\text{New average} = \frac{180}{5} = 36$$

Answer: (D)

Q12.

Solution

Work done per day: $A = \frac{1}{6}$, $B = \frac{1}{8}$, $C = \frac{1}{12}$

Combined rate = $\frac{1}{6} + \frac{1}{8} + \frac{1}{12}$

LCM of 6, 8, 12 is 24:

$$= \frac{4}{24} + \frac{3}{24} + \frac{2}{24} = \frac{9}{24} = \frac{3}{8} \text{ (work per day)}$$

$$\text{Time} = \frac{1}{\frac{3}{8}} = \frac{8}{3} \text{ days} = 2\frac{2}{3} \text{ days.}$$

Answer: (A)

Q13.

Solution

Total work = $6 \times 10 = 60$ man-days = $8 \times 10 = 80$ woman-days.

From the equivalence: 6 men = 8 women, so 1 man = $\frac{4}{3}$ women.

3 men = $3 \times \frac{4}{3} = 4$ women (in work capacity).

3 men + 4 women = 4 women + 4 women = 8 women

Time = $\frac{80 \text{ woman-days}}{8 \text{ women}} = 10 \text{ days.}$

Answer: (B)

Q14.

Solution

When two persons move towards each other, relative speed = sum of their speeds.

Relative speed = $30 + 40 = 70$ km/h

Time to meet = $\frac{\text{Distance}}{\text{Relative speed}} = \frac{140}{70} = 2 \text{ hours.}$

Answer: (C)

Q15.



Solution

$$\text{Upstream speed} = \frac{24}{6} = 4 \text{ km/h}$$

$$\text{Downstream speed} = \frac{24}{4} = 6 \text{ km/h}$$

$$\text{Speed of current} = \frac{\text{Downstream speed} - \text{Upstream speed}}{2} = \frac{6 - 4}{2} = 1 \text{ km/h.}$$

Answer: (D)**Q16.****Solution**

Let the three consecutive even integers be $n, n + 2, n + 4$.

$$n + (n + 2) + (n + 4) = 54 \implies 3n + 6 = 54 \implies 3n = 48 \implies n = 16$$

The three integers are 16, **18**, 20. The middle integer is 18.

Answer: (A)**Q17.****Solution**

Use the algebraic identity $(a - b)^2 = a^2 - 2ab + b^2$ with $a = 3a$ and $b = 2b$:

$$(3a - 2b)^2 = (3a)^2 - 2(3a)(2b) + (2b)^2 = 9a^2 - 12ab + 4b^2$$

Answer: (B)**Q18.****Solution**

Vertically opposite angles are equal in measure:

$$4y + 20 = 6y - 10$$

$$20 + 10 = 6y - 4y \implies 30 = 2y \implies y = 15$$

$$\text{Each angle} = 4(15) + 20 = 60 + 20 = 80^\circ.$$

$$\text{Verification: } 6(15) - 10 = 90 - 10 = 80^\circ. \checkmark$$

Answer: (C)**Q19.**

Solution

Since $AB = AC$, triangle ABC is isosceles, so the base angles are equal: $\angle B = \angle C$.

By the angle sum property of a triangle:

$$\angle A + \angle B + \angle C = 180^\circ$$

$$50^\circ + 2\angle B = 180^\circ \implies 2\angle B = 130^\circ \implies \angle B = 65^\circ$$

Answer: (D)

Q20.

Solution

The ratio of corresponding sides of similar triangles is constant.

Shortest side of first triangle = 4 cm; shortest side of second triangle = 6 cm.

$$\text{Scale factor} = \frac{6}{4} = \frac{3}{2}$$

$$\text{Longest side of second triangle} = 8 \times \frac{3}{2} = 12 \text{ cm.}$$

Answer: (A)

Q21.

Solution

The diagonals of a rectangle bisect each other. So O is the midpoint of each diagonal.

Each diagonal = 10 cm, so:

$$OA = OB = OC = OD = \frac{10}{2} = 5 \text{ cm}$$

The distance from the centre O to any vertex is 5 cm.

Answer: (B)

Q22.

Solution

Since a radius is perpendicular to a tangent at the point of tangency:

$$\angle OAP = \angle OBP = 90^\circ$$



In quadrilateral $OAPB$, the sum of all angles is 360° :

$$\angle OAP + \angle APB + \angle PBO + \angle AOB = 360^\circ$$

$$90^\circ + 60^\circ + 90^\circ + \angle AOB = 360^\circ$$

$$\angle AOB = 360^\circ - 240^\circ = 120^\circ$$

Answer: (C)

Q23.

Solution

$$\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 14 \times 9 = 7 \times 9 = 63 \text{ cm}^2$$

Answer: (D)

Q24.

Solution

A cube has 6 equal square faces, each with area a^2 .

$$\text{Total Surface Area} = 6a^2 = 6 \times (7)^2 = 6 \times 49 = 294 \text{ cm}^2$$

Answer: (A)

Q25.

Solution

$$\text{Circumference} = \pi d = \frac{22}{7} \times 21 = 22 \times 3 = 66 \text{ cm}$$

Answer: (B)

Solution

Count the frequency of each value in the data set $\{3, 5, 7, 5, 8, 3, 5, 9, 3, 5\}$:

- Q26.
- 3 appears 3 times
 - 5 appears 4 times (most frequent)
 - 7 appears 1 time
 - 8 appears 1 time
 - 9 appears 1 time

The value with the highest frequency is 5. Mode = 5.

Answer: (C)



Q27.

Solution

The full pie chart represents 360° and 100% of the data.

$$\text{Percentage for Science} = \frac{\text{Sector angle}}{360^\circ} \times 100 = \frac{72}{360} \times 100 = \frac{1}{5} \times 100 = 20\%$$

Answer: (D)

Q28.

Solution

A fair die has faces numbered 1 through 6. Total outcomes = 6.

Favourable outcomes (numbers greater than 4): $\{5, 6\} \rightarrow 2$ outcomes.

$$P(\text{number} > 4) = \frac{2}{6} = \frac{1}{3}$$

Answer: (A)

Q29.

Solution

We need $\sqrt{2025}$.

$$45^2 = 45 \times 45 = 2025 \checkmark$$

Therefore, $\sqrt{2025} = 45$.

Answer: (B)

Q30.

Solution

Let Sita's current age = x years. Then Ravi's current age = $3x$ years.

Five years later:

$$3x + 5 = 2(x + 5)$$

$$3x + 5 = 2x + 10$$

$$x = 5$$

Ravi's current age = $3 \times 5 = 15$ years.

Answer: (C)

Answer Key

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

