

YASASVI Mathematics

Sample Paper – 10

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. Which is the largest among the following fractions: $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{8}$,

$\frac{11}{12}$?

- (A) $\frac{3}{4}$
(B) $\frac{5}{6}$
(C) $\frac{11}{12}$
(D) $\frac{7}{8}$

Q2. Find the value of $\left(\frac{2}{3}\right)^{-3}$.

- (A) $\frac{8}{27}$



- (B) $-\frac{27}{8}$
(C) $-\frac{8}{27}$
(D) $\frac{27}{8}$

Q3. The LCM of two numbers is 180 and their HCF is 12. If one number is 36, find the other number.

- (A) 60
(B) 48
(C) 72
(D) 90

Q4. Two alloys contain gold and silver in ratios 3 : 2 and 1 : 4 respectively. If equal masses of both alloys are mixed, find the ratio of gold to silver in the mixture.

- (A) 1 : 2
(B) 2 : 3
(C) 3 : 4
(D) 1 : 3

Q5. The price of rice fell from Rs 60 per kg to Rs 48 per kg. By what percentage did it fall?

- (A) 15%
(B) 18%
(C) 20%



(D) 25%

Q6. A refrigerator costs Rs 8,000. What should be the marked price so that after giving a 20% discount, a profit of 25% is still made?

(A) Rs 10,000

(B) Rs 11,000

(C) Rs 12,000

(D) Rs 12,500

Q7. A chair bought for Rs 1,400 is sold for Rs 1,260. Find the loss percentage.

(A) 10%

(B) 8%

(C) 12%

(D) 15%

Q8. A watch was sold for Rs 1,500, making a profit of Rs 300. Find the cost price.

(A) Rs 1,100

(B) Rs 1,200

(C) Rs 1,300

(D) Rs 1,400

Q9. Find the total amount payable on a principal of Rs 3,500 at 6% simple interest per annum for 2 years.



- (A) Rs 3,700
- (B) Rs 3,800
- (C) Rs 3,920
- (D) Rs 4,000

Q10. For Rs 5,000 at 10% per annum for 2 years, find the difference between the compound interest and the simple interest.

- (A) Rs 25
- (B) Rs 40
- (C) Rs 45
- (D) Rs 50

Q11. Find the mean of: 72, 84, 90, 66, 78, 90.

- (A) 80
- (B) 75
- (C) 78
- (D) 82

Q12. 10 women can complete a work in 8 days and 16 men can complete it in 6 days. In how many days can 4 women and 8 men together finish the work?

- (A) 6 days
- (B) 7.5 days
- (C) 8 days
- (D) 10 days



Q13. P, Q, and R can finish a work in 6, 8, and 12 days respectively. They work together for 2 days. What fraction of work remains?

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

(B) $\frac{1}{2}$

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

(D) $\frac{3}{8}$

Q14. Car A starts at 8:00 am from a point at 40 km/h. Car B starts from the same point at 10:00 am at 60 km/h. At what time does B overtake A?

(A) 12:00 noon

(B) 1:00 pm

(C) 1:30 pm

(D) 2:00 pm

Q15. A train travelling at 90 km/h crosses a 500 m bridge in 40 seconds. Find the length of the train.

(A) 500 m

(B) 400 m

(C) 600 m

(D) 450 m

Q16. If $\frac{2x + 3}{5} = 3$, find x .

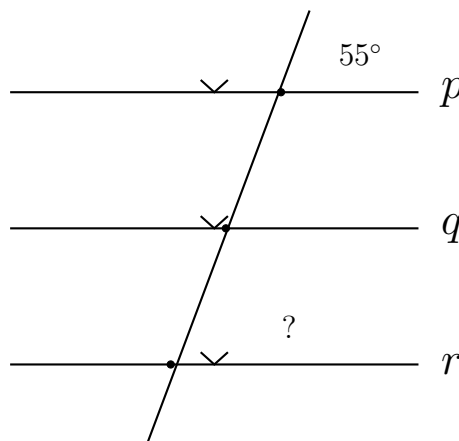


- (A) 4
- (B) 6
- (C) 9
- (D) 5

Q17. Using the identity $(a - b)^2 = a^2 - 2ab + b^2$, find the value of 99^2 .

- (A) 9,601
- (B) 9,701
- (C) 9,801
- (D) 9,901

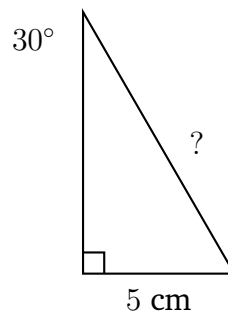
Q18. Three parallel lines p, q, r are cut by a transversal. The angle between the transversal and p is 55° . What is the corresponding angle between the transversal and r ?



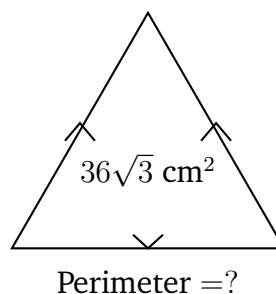
- (A) 35°
- (B) 90°
- (C) 125°
- (D) 55°



- Q19.** In a right triangle, one acute angle is 30° . If the side opposite to the 30° angle measures 5 cm, find the hypotenuse.

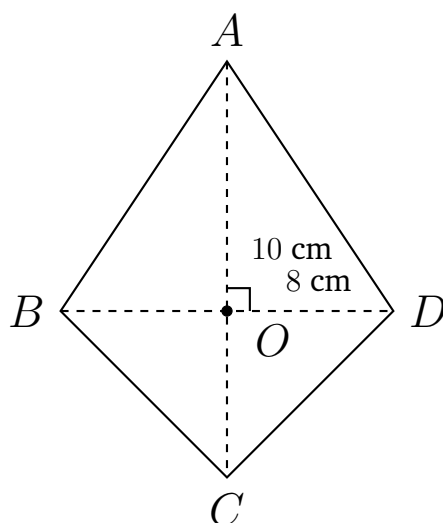


- (A) 10 cm
(B) $5\sqrt{3}$ cm
(C) $5\sqrt{2}$ cm
(D) 15 cm
- Q20.** The area of an equilateral triangle is $36\sqrt{3}\text{ cm}^2$. Find its perimeter.



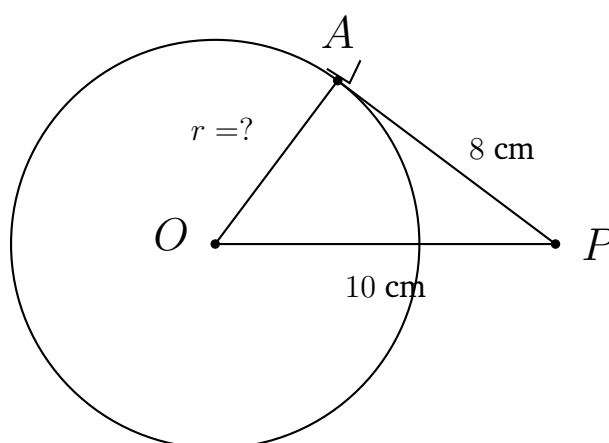
- (A) 24 cm
(B) 36 cm
(C) 48 cm
(D) 30 cm
- Q21.** In a kite $ABCD$, the diagonals AC and BD are perpendicular and intersect at O . If $AC = 10\text{ cm}$ and $BD = 8\text{ cm}$, find the area of the kite.





- (A) 30 cm^2
- (B) 35 cm^2
- (C) 40 cm^2
- (D) 45 cm^2

Q22. A tangent from an external point P is 8 cm long. The distance from the external point to the centre O is 10 cm . Find the radius of the circle.



- (A) 4 cm
- (B) 5 cm
- (C) 7 cm



(D) 6 cm

Q23. A rectangle is 20 cm long and 14 cm wide. A semicircle of diameter 14 cm is cut from one shorter side. Find the remaining area. (Use $\pi = \frac{22}{7}$)

(A) 203 cm²

(B) 185 cm²

(C) 190 cm²

(D) 210 cm²

Q24. A conical tent has base radius 7 m and slant height 25 m. Find the curved surface area. (Use $\pi = \frac{22}{7}$)

(A) 480 m²

(B) 550 m²

(C) 600 m²

(D) 660 m²

Q25. Find the area of a sector of a circle with radius 14 cm and central angle 90°. (Use $\pi = \frac{22}{7}$)

(A) 77 cm²

(B) 120 cm²

(C) 154 cm²

(D) 176 cm²

Q26. The mean of 10 observations is 20. One observation with value 15 is changed to 25. What is the new mean?



- (A) 19
- (B) 20
- (C) 20.5
- (D) 21

Q27. A line graph shows a company's annual profit (in lakhs): 2019: 5, 2020: 7, 2021: 9, 2022: 8, 2023: 12. In which year was the profit the highest?

- (A) 2023
- (B) 2021
- (C) 2022
- (D) 2020

Q28. A bag contains 5 red, 4 blue, and 3 green marbles. One marble is drawn at random. Find the probability of drawing a blue marble.

- (A) $\frac{1}{4}$
- (B) $\frac{1}{3}$
- (C) $\frac{5}{12}$
- (D) $\frac{1}{2}$

Q29. Find the next term in the sequence: 3, 6, 12, 24, ...

- (A) 36
- (B) 40



(C) 48

(D) 56

Q30. A square plot has a perimeter of 100 m. Find the cost of fencing it at Rs 15 per metre.

(A) Rs 1,000

(B) Rs 1,200

(C) Rs 1,400

(D) Rs 1,500



Detailed Solutions

Q1.

Solution

Convert all fractions to a common denominator of 24:

$$\frac{3}{4} = \frac{18}{24}, \quad \frac{5}{6} = \frac{20}{24}, \quad \frac{7}{8} = \frac{21}{24}, \quad \frac{11}{12} = \frac{22}{24}$$

Comparing the numerators: $18 < 20 < 21 < 22$.

Therefore $\frac{22}{24} = \frac{11}{12}$ is the largest fraction.

Answer: (C)

Q2.

Solution

A negative exponent means taking the reciprocal:

$$\left(\frac{2}{3}\right)^{-3} = \left(\frac{3}{2}\right)^3 = \frac{3^3}{2^3} = \frac{27}{8}$$

Answer: (D)

Q3.

Solution

For two numbers, the product of their LCM and HCF equals the product of the numbers:

$$\text{LCM} \times \text{HCF} = \text{Number}_1 \times \text{Number}_2$$

$$180 \times 12 = 36 \times \text{Number}_2$$

$$\text{Number}_2 = \frac{180 \times 12}{36} = \frac{2160}{36} = 60$$

Answer: (A)

Q4.

Solution

Take equal masses of 1 unit each.

From the **first alloy** (gold : silver = 3 : 2): Gold = $\frac{3}{5}$, Silver = $\frac{2}{5}$

From the **second alloy** (gold : silver = 1 : 4): Gold = $\frac{1}{5}$, Silver = $\frac{4}{5}$



In the mixture:

$$\text{Total Gold} = \frac{3}{5} + \frac{1}{5} = \frac{4}{5}, \quad \text{Total Silver} = \frac{2}{5} + \frac{4}{5} = \frac{6}{5}$$

$$\text{Ratio of Gold to Silver} = \frac{4}{5} : \frac{6}{5} = 4 : 6 = 2 : 3$$

Answer: (B)

Q5.

Solution

$$\text{Fall in price} = 60 - 48 = \text{Rs } 12$$

$$\text{Percentage fall} = \frac{\text{Fall}}{\text{Original price}} \times 100 = \frac{12}{60} \times 100 = 20\%$$

Answer: (C)

Q6.

Solution

$$\text{Cost Price (CP)} = \text{Rs } 8,000$$

A 25% profit means:

$$\text{Selling Price (SP)} = 8000 \times \left(1 + \frac{25}{100}\right) = 8000 \times 1.25 = \text{Rs } 10,000$$

After a 20% discount the SP equals 80% of the Marked Price:

$$\text{SP} = \text{MP} \times \frac{80}{100} \implies 10000 = \text{MP} \times 0.80$$

$$\text{MP} = \frac{10000}{0.80} = \text{Rs } 12,500$$

Answer: (D)

Q7.

Solution

$$\text{Loss} = \text{CP} - \text{SP} = 1400 - 1260 = \text{Rs } 140$$



$$\text{Loss\%} = \frac{\text{Loss}}{\text{CP}} \times 100 = \frac{140}{1400} \times 100 = 10\%$$

Answer: (A)

Q8.

Solution

$$\text{Cost Price} = \text{Selling Price} - \text{Profit} = 1500 - 300 = \text{Rs } 1,200$$

Answer: (B)

Q9.

Solution

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

$$SI = \frac{3500 \times 6 \times 2}{100} = \frac{42000}{100} = \text{Rs } 420$$

$$\text{Total Amount} = P + SI = 3500 + 420 = \text{Rs } 3,920$$

Answer: (C)

Q10.

Solution

Simple Interest:

$$SI = \frac{5000 \times 10 \times 2}{100} = \text{Rs } 1,000$$

Compound Interest:

$$\text{Amount} = 5000 \times \left(1 + \frac{10}{100}\right)^2 = 5000 \times (1.1)^2 = 5000 \times 1.21 = \text{Rs } 6,050$$

$$CI = 6050 - 5000 = \text{Rs } 1,050$$

$$\text{Difference: } CI - SI = 1050 - 1000 = \text{Rs } 50$$

Answer: (D)

Q11.

Solution

$$\text{Sum} = 72 + 84 + 90 + 66 + 78 + 90 = 480$$



$$\text{Mean} = \frac{480}{6} = 80$$

Answer: (A)

Q12.

Solution

Total work = $10 \times 8 = 80$ woman-days = $16 \times 6 = 96$ man-days.

Rate per woman = $\frac{1}{80}$ of work per day; rate per man = $\frac{1}{96}$ of work per day.

Combined rate of 4 women and 8 men:

$$\frac{4}{80} + \frac{8}{96} = \frac{1}{20} + \frac{1}{12} = \frac{3}{60} + \frac{5}{60} = \frac{8}{60} = \frac{2}{15} \text{ (work per day)}$$

$$\text{Time} = \frac{1}{\frac{2}{15}} = \frac{15}{2} = 7.5 \text{ days}$$

Answer: (B)

Q13.

Solution

Work done per day: $P = \frac{1}{6}$, $Q = \frac{1}{8}$, $R = \frac{1}{12}$

LCM of 6, 8, 12 is 24. Combined rate:

$$\frac{1}{6} + \frac{1}{8} + \frac{1}{12} = \frac{4}{24} + \frac{3}{24} + \frac{2}{24} = \frac{9}{24} = \frac{3}{8} \text{ (work per day)}$$

Work done in 2 days:

$$2 \times \frac{3}{8} = \frac{6}{8} = \frac{3}{4}$$

Remaining work:

$$1 - \frac{3}{4} = \frac{1}{4}$$

Answer: (C)

Q14.

Solution

By 10:00 am (when B starts), Car A has been travelling for 2 hours:

$$\text{Distance covered by A} = 40 \times 2 = 80 \text{ km ahead}$$



Both cars now move in the same direction. Relative speed of B over A:

$$60 - 40 = 20 \text{ km/h}$$

Time for B to close the 80 km gap:

$$\text{Time} = \frac{80}{20} = 4 \text{ hours after 10:00 am}$$

B overtakes A at 10:00 am + 4 hours = **2:00 pm.**

Answer: (D)

Q15.

Solution

Convert speed: $90 \text{ km/h} = \frac{90 \times 1000}{3600} = 25 \text{ m/s}$

Distance covered by the train in 40 seconds:

$$d = 25 \times 40 = 1000 \text{ m}$$

This distance equals the length of the train plus the length of the bridge:

$$\text{Length of train} + 500 = 1000$$

$$\text{Length of train} = 1000 - 500 = 500 \text{ m}$$

Answer: (A)

Q16.

Solution

$$\frac{2x + 3}{5} = 3$$

Multiply both sides by 5:

$$2x + 3 = 15$$

Subtract 3 from both sides:

$$2x = 12 \implies x = 6$$

Answer: (B)

Q17.



Solution

Write $99 = 100 - 1$ and apply the identity $(a - b)^2 = a^2 - 2ab + b^2$:

$$\begin{aligned} 99^2 &= (100 - 1)^2 = 100^2 - 2 \times 100 \times 1 + 1^2 \\ &= 10000 - 200 + 1 = 9,801 \end{aligned}$$

Answer: (C)

Q18.

Solution

When a transversal cuts two or more parallel lines, **corresponding angles** are equal.

Lines p , q , and r are all parallel. The angle between the transversal and line p is 55° .

The corresponding angle between the transversal and line r is therefore also 55° .

Answer: (D)

Q19.

Solution

In a right triangle, the angles are 90° , 30° , and 60° .

A key property of the 30-60-90 triangle:

$$\text{Hypotenuse} = 2 \times (\text{side opposite to } 30^\circ)$$

The side opposite to the 30° angle = 5 cm.

$$\text{Hypotenuse} = 2 \times 5 = 10 \text{ cm}$$

Answer: (A)

Q20.

Solution

Formula for area of equilateral triangle with side a :

$$\text{Area} = \frac{\sqrt{3}}{4} a^2$$



Setting this equal to the given area:

$$\frac{\sqrt{3}}{4}a^2 = 36\sqrt{3}$$

$$a^2 = \frac{36\sqrt{3} \times 4}{\sqrt{3}} = 144 \implies a = 12 \text{ cm}$$

$$\text{Perimeter} = 3a = 3 \times 12 = 36 \text{ cm}$$

Answer: (B)

Q21.

Solution

The area of a kite is given by:

$$\text{Area} = \frac{1}{2} \times d_1 \times d_2$$

where d_1 and d_2 are the lengths of the diagonals.

$$\text{Area} = \frac{1}{2} \times AC \times BD = \frac{1}{2} \times 10 \times 8 = 40 \text{ cm}^2$$

Answer: (C)

Q22.

Solution

A radius drawn to the point of tangency is perpendicular to the tangent. So $\angle OAP = 90^\circ$.

In right triangle OAP , by the Pythagorean theorem:

$$OA^2 + PA^2 = OP^2$$

$$r^2 + 8^2 = 10^2$$

$$r^2 = 100 - 64 = 36$$

$$r = 6 \text{ cm}$$

Answer: (D)

Q23.



Solution**Area of rectangle:**

$$20 \times 14 = 280 \text{ cm}^2$$

Area of semicircle (diameter = 14 cm, radius = 7 cm):

$$\frac{1}{2} \times \pi r^2 = \frac{1}{2} \times \frac{22}{7} \times 7^2 = \frac{1}{2} \times \frac{22}{7} \times 49 = \frac{1}{2} \times 154 = 77 \text{ cm}^2$$

Remaining area:

$$280 - 77 = 203 \text{ cm}^2$$

Answer: (A)**Q24.****Solution**Given: base radius $r = 7$ m, slant height $l = 25$ m.**Curved Surface Area (CSA) of cone:**

$$\text{CSA} = \pi r l = \frac{22}{7} \times 7 \times 25 = 22 \times 25 = 550 \text{ m}^2$$

Answer: (B)**Q25.****Solution**Formula for area of sector with radius r and central angle θ :

$$\text{Area} = \frac{\theta}{360} \times \pi r^2$$

$$\text{Area} = \frac{90}{360} \times \frac{22}{7} \times 14^2 = \frac{1}{4} \times \frac{22}{7} \times 196 = \frac{1}{4} \times 22 \times 28 = \frac{616}{4} = 154 \text{ cm}^2$$

Answer: (C)**Q26.****Solution**Original sum of observations = $10 \times 20 = 200$

New sum after changing 15 to 25:

$$\text{New sum} = 200 - 15 + 25 = 210$$



$$\text{New mean} = \frac{210}{10} = 21$$

Answer: (D)

Solution

Reading the profit values from the line graph:

- Q27.
- 2019: 5 lakhs
 - 2020: 7 lakhs
 - 2021: 9 lakhs
 - 2022: 8 lakhs
 - 2023: **12 lakhs (highest)**

The profit was highest in the year **2023**.

Answer: (A)

Q28.

Solution

Total number of marbles = $5 + 4 + 3 = 12$

Number of blue marbles = 4

$$P(\text{blue marble}) = \frac{4}{12} = \frac{1}{3}$$

Answer: (B)

Q29.

Solution

Identify the pattern in the sequence 3, 6, 12, 24, ...

Each term is obtained by multiplying the previous term by 2 (a geometric sequence with common ratio 2):

$$3 \rightarrow 6 \rightarrow 12 \rightarrow 24 \rightarrow 48$$

The next term is $24 \times 2 = 48$.

Answer: (C)

Q30.



Solution

The perimeter of the square plot is already given as 100 m.

$$\begin{aligned}\text{Cost of fencing} &= \text{Perimeter} \times \text{Rate per metre} \\ &= 100 \times 15 = \text{Rs } 1,500\end{aligned}$$

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

