

CBSE
Class VII
Mathematics Term 1
Sample Paper - 3

- Q1.** The square of an odd integer is _____.
- (a) A positive even number
 - (b) A positive odd number
 - (c) A negative even number
 - (d) A negative odd number

Sol. (b)
The square of an odd integer is a positive odd number.

- Q2.** The sum of the cost price and _____ is called the net price of that product.
- (a) Additional expenses
 - (b) Profit
 - (c) Loss
 - (d) Selling price

Sol. (a)
The sum of the cost price and additional expenses is called the net price of that product.
The Net price of a product = cost price + Additional Expense

- Q3.** Manojbhai bought an old tractor through a broker for Rs. 2, 50, 000. The broker charged 1% brokerage from the seller and 2% brokerage from the buyer. What is the total amount of brokerage received by the broker?
- (a) 7400
 - (b) 7500
 - (c) 6500
 - (d) None of these

Sol. (c)
Total amount of brokerage = brokerage charged from the seller + brokerage charged from the buyer.

$$\therefore \text{Total amount of brokerage} = 1\% \text{ of Rs. } 2,250,000 + 2\% \text{ of Rs. } 2,250,000$$

$$\therefore \text{Total amount of brokerage} = 3\% \text{ of Rs. } 2,250,000$$

$$3\% \text{ of } 250000 = \frac{3}{100} \times 250000 \\ = 7500$$

\therefore Total amount of brokerage received by Manojbhai is Rs. 7500.

- Q4.** What is the smallest number by which 1458 should be divided so that the quotient becomes a perfect square?
- (a) 3
(b) 4
(c) 5
(d) 2

Sol. (d)

To find the smallest number, by which 1458 be divided so that the quotient becomes a perfect square; find the prime factors of 1458.

2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

$$\begin{aligned} \therefore 1458 &= 2 \times \underline{3 \times 3 \times 3 \times 3 \times 3} \times \underline{3 \times 3} \\ &= 2 \times 3^2 \times 3^2 \times 3^2 \end{aligned}$$

The prime factor 2 does not make a pair.

Hence, 1458 should be divided by 2 to make the quotient a perfect square

- Q5.** Simplify: $(4m^2 - 3m - 5) - (2m^2 - 2m - 3) + (2m^2 + 2m + 5)$
- (a) $4m^2 + m - 3$
(b) $4m^2 + m + 3$
(c) $4m^2 - m - 3$
(d) None of these

Sol. (b)

$$\begin{aligned} &(4m^2 - 3m - 5) - (2m^2 - 2m - 3) + (2m^2 + 2m + 5) \\ &= 4m^2 - 3m - 5 - 2m^2 + 2m + 3 + 2m^2 + 2m + 5 \quad (\text{To subtract any term means to add its opposite term}) \\ &= 4m^2 - 2m^2 + 2m^2 - 3m + 2m + 2m - 5 + 3 + 5 \\ &= (4 - 2 + 2)m^2 + (-3 + 2 + 2)m + 3 \\ &= (4)m^2 + (1)m + 3 \\ &= 4m^2 + m + 3 \end{aligned}$$

Paragraph

(This paragraphs is for questions 6 to 9)

The following pie graph shows the information about participation of 60 students of a school in various games during the sports day.



Answer the questions below based on the graph.

Q6. How many student took part in the lemon and spoon race?

- (a) 14
- (b) 16
- (c) 15
- (d) None of these

Sol. (c)

Number of students who took part in the lemon and spoon race:

$$\frac{\text{Degree measure for lemon and spoon race}}{360^\circ} \times \text{Total number of students}$$
$$= \frac{90^\circ}{360^\circ} \times 60$$
$$= 15$$

Hence, 15 students participated in lemon and spoon race.

Q7. Which game had the least number of students?

- (a) High jump
- (b) Spot put
- (c) Running
- (d) Long jump

Sol. (a)

The least number of students who participated in a game:

As the degree measure of angle corresponding to high jump = 30°. This is the least amongst all the games; hence least number of students participated in the high jump.

Q8. Which game had the maximum number of students?

- (a) High jump
- (b) Spot put
- (c) Running
- (d) Long jump

Sol. (c)

The maximum number of students who participated in a game. As the degree measure of angle corresponding to running = 108° . This is the maximum amongst all the games, hence maximum number of students participated in running.

Q9. How many students took part in shot put?

- (a) 10
- (b) 20
- (c) 30
- (d) 40

Sol. (a)

Number of students who took part in shot put:

$$\frac{\text{Degree measure for Shot put}}{360^\circ} \times \text{Total number of students}$$

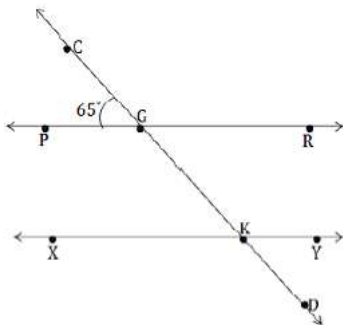
$$= \frac{60^\circ}{360^\circ} \times 60$$

$$= 10$$

Hence, 10 students took part in shot put.

Q10. $\overline{PR} \parallel \overline{XY}$ and \overline{CD} is the transversal. If $m\angle PGC = 65^\circ$, find the $\angle GKY$

- (a) 120°
- (b) 110°
- (c) 115°
- (d) None of these



Sol. (c)

Given: $\overline{PR} \parallel \overline{XY}$

\overline{CD} is the transversal

$$m \angle PGC = 65^\circ$$

$\angle PGK$ and $\angle GKY$ are alternate angles.

$$\therefore m \angle PGK = m \angle GKY$$

$$\text{But } \angle PGK = 115^\circ$$

$$\therefore m \angle GKY = 115^\circ$$

Q11. A trader buys some TVs at a 20% rebate on the printed price of Rs. 18,000. For a long time he could not sell any TV. So he sells it by giving a rebate of Rs. 2700 on the printed price. What amount of profit or loss does he make? Calculate the percentage rebate for the customer.

(a) 10%

(b) 15%

(c) 25%

(d) 20%

Sol. (b)

Given

Printed Price of TVs = Rs. 18,000

Percentage of rebate on purchase = 20% on printed price.

Amount of rebate on sale = Rs. 2700

Amount of rebate on purchase = 20% of printed price

$$\frac{20}{100} \times 18000 = \text{Rs. } 3600$$

Hence, N.P. of each TV = Printed Price – Rebate

$$\text{Hence, N.P. of each TV} = \text{Rs. } 18,000 - \text{Rs. } 3600 = \text{Rs. } 14,400$$

Hence, N.P. of each TV = Rs. 14,400

Selling price of each TV = Printed price – Rebate

$$= \text{Rs. } 18,000 - \text{Rs. } 2700 = \text{Rs. } 15,300$$

Hence, S.P. of each TV = Rs. 15,300

Hence, S.P. > N.P.; hence there is profit.

Profit = S.P. – N.P.

$$= \text{Rs. } 15,300 - \text{Rs. } 14,400$$

$$= \text{Rs. } 900$$

Hence, the trader makes profit of Rs. 900 per T.V.

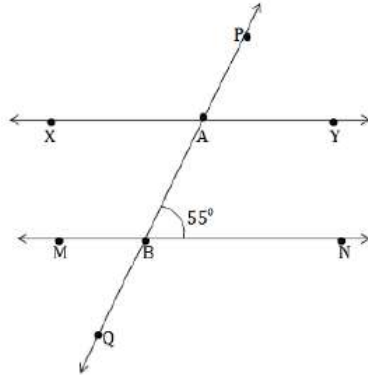
The percentage rebate the customer earns:

$$\frac{\text{Amount of Rebate}}{\text{Printed price}} \times 100$$

$$= \frac{2700}{18000} \times 100 = 15\%$$

Hence, the customer earns a rebate of 15%

- Q12.** $\overline{XY} \parallel \overline{MN}$ and \overline{PQ} is the transversal intersects \overline{XY} at point A and \overline{MN} at point B. If $m\angle NBP = 55^\circ$, find the $\angle PAX$?

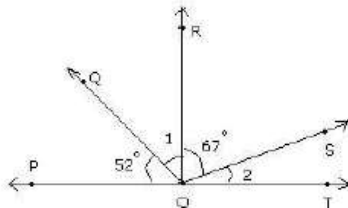


- (a) 110°
(b) 120°
(c) 115°
(d) 125°

Sol.

(d)
Given: $\overline{XY} \parallel \overline{MN}$
 \overline{PQ} is the transversal
 $m\angle NBP = 55^\circ$
 $\angle PAX$ and $\angle ABM$ Are corresponding angles.
 $\therefore m\angle PAX = m\angle ABM$
 $\therefore m\angle PAX = 125^\circ$

- Q13.** If RO is the perpendicular to PT, then find the measure of angles 1 and 2 in the figure below:



- (a) 38°
(b) 48°
(c) 26°
(d) None of these

Sol. (a)

In the figure, we can see that $\angle POR$ and $\angle ROT$ are right angles.

$$\text{Thus, } m\angle ROS + m\angle 2 = 90^\circ$$

$$\Rightarrow 67^\circ + m\angle 2 = 90^\circ$$

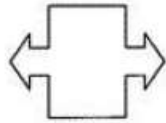
$$\Rightarrow m\angle 2 = 90^\circ - 67^\circ = 23^\circ$$

$$\text{Also, } m\angle POQ + m\angle 1 = 90^\circ$$

$$\Rightarrow 52^\circ + m\angle 1 = 90^\circ$$

$$\Rightarrow m\angle 1 = 90^\circ - 52^\circ = 38^\circ$$

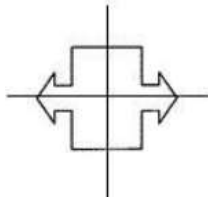
Q14. Draw and count the number of lines of symmetry for the following figure.



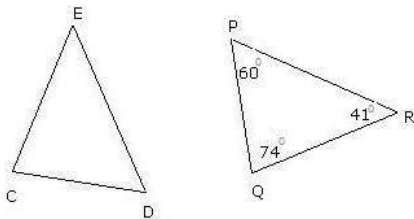
- (a) 1
- (b) 2
- (c) 3
- (d) 4

Sol. (b)

The 2 lines of symmetry are as shown below:



Q15. In the figure below, $\triangle CDE \cong \triangle QPR$. What is $m\angle D$?



- (a) 45°
- (b) 90°
- (c) 60°
- (d) None of these

Sol. (c)

Given, $\Delta CDE \cong \Delta QPR$

We have to find the angle in ΔPQR which corresponds to $\angle D$.

Now, since the corresponding parts of congruent triangles are congruent, $\angle D \cong \angle P$.

Hence, $m\angle D = 60^\circ$

Q16. What should be added to $x^2 + xy + y^2$ to obtain $2x^2 + 3xy$?

(a) $x^2 - 2xy - y^2$

(b) $x^2 - 2xy + y^2$

(c) $x^2 + 2xy + y^2$

(d) $x^2 + 2xy - y^2$

Sol. (d)

The expression to be added is given by:

$$(2x^2 + 3xy) - (x^2 + xy + y^2)$$

$$= 2x^2 + 3xy - x^2 - xy - y^2$$

$$= 2x^2 - x^2 + 3xy - xy - y^2$$

$$= x^2 + 2xy - y^2$$

Q17. It takes $\frac{2}{5}$ yards of material to make a shirt. How many yards of material will be required to make 6 shirts?

(a) $\frac{12}{5}$

(b) $\frac{11}{5}$

(c) $\frac{13}{5}$

(d) None of these

Sol. (a)

Material required to make 1 shirt = $\frac{2}{5}$ yards

$$\text{Material required to make 6 shirts} = \frac{2}{5} \times 6 = \frac{2}{5} \times \frac{6}{1} = \frac{12}{5}$$

Thus, to make 6 shirts, $\frac{12}{5}$ yards of material will be required.

Paragraph

(This paragraph is for questions 18 to 20)

The bar graph given shows the sales of books (in thousands) from six branches of a publishing company during two consecutive years, 2000 and 2001.



- Q18.** What is the ratio of the total sales of branches B2 for both years to the total sales of branch B4 for both years?
- (a) 7 : 3
(b) 7 : 9
(c) 9 : 7
(d) 3 : 7

Sol. (b)
Sales of branch B2 for both years = 75 + 65 = 140
Sales of branch B4 for both years = 85 + 95 = 180
Required ratio = $\frac{140}{180} = \frac{7}{9} = 7 : 9$

- Q19.** What is the average sale of all the branches (in thousands) for the year 2000?
- (a) 70
(b) 60
(c) 80
(d) 100

Sol. (c)
Average sales of all the six branches (in thousands) for the year 2000
 $= \frac{1}{6} \times (80 + 75 + 95 + 85 + 75 + 70) = 80$

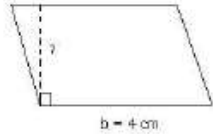
- Q20.** Total sales of branches B6 for both the years are what percent of the total sales of branch B3 for both the years?
- (a) 73.15%
(b) 72.17%
(c) 61.17%
(d) 73.17%

Sol. (d)
Total sales of branch B6 for both the years = 70 + 80 = 150

Total sales of branch B3 for both the years = $95 + 110 = 205$

Required percentage = $\left(\frac{150}{205} \times 100\right) \% = 73.17\%$

- Q21.** In the figure given below, the area of the parallelogram is 24 cm^2 and the base is 4 cm . Find the height.



- (a) 6 cm
- (b) 4 cm
- (c) 5 cm
- (d) None of these

Sol. (a)
Area of the parallelogram is given as 24 cm^2 , base (b) = 4 cm
Let the height of the parallelogram be $h \text{ cm}$.
Now, area of the parallelogram = base (b) \times height (h)
 $\Rightarrow 24 = 4 \times h$
 $\Rightarrow h = 6 \text{ cm}$
Thus, the height of the parallelogram is 6 cm .

- Q22.** The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?
- (a) 1800
 - (b) 1500
 - (c) 2000
 - (d) None of these

Sol. (c)

Let C.P. be Rs. x .

If S.P. = Rs. 1920, then

$$\text{Profit}\% = \frac{\text{Profit}}{\text{C.P.}} \times 100$$

$$\Rightarrow \text{Profit}\% = \frac{1920 - x}{x} \times 100$$

If S.P. = Rs. 1280, then

$$\text{Loss}\% = \frac{\text{Loss}}{\text{C.P.}} \times 100$$

$$\Rightarrow \text{Loss}\% = \frac{x - 1280}{x} \times 100$$

As given in the question,

$$\frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100$$

$$\Rightarrow 1920 - x = x - 1280$$

$$\Rightarrow 2x = 3200$$

$$\Rightarrow x = 1600$$

Therefore, required S.P. = 125% of Rs. 1600

$$\text{i.e. Rs.} \left(\frac{125}{100} \times 1600 \right) = \text{Rs. } 2000$$

Q23. Which of the following is the greatest rational number?

- (a) 15/7
- (b) 15/8
- (c) 15/10
- (d) 15/12

Sol. (a)

Since the numerators are equal, the rational number with the least denominator is the greatest.

Q24. Mean of 11, 10, 12, 12, 9, 10, 14, 12 and 9 is

- (a) 20
- (b) 10
- (c) 11
- (d) 14

Sol. (c)

The given observations are 11, 10, 12, 12, 9, 10, 14, 12 and 9.

$$\text{Mean} = \frac{11+10+12+12+9+10+14+12+9}{9} = \frac{99}{9} = 11$$

Q25. If on adding 9 to twice of a whole number we get 31, then the whole number is

- (a) 21
- (b) 16
- (c) 17
- (d) 11

Sol. (d)
Let the whole number be x .
Twice of the whole number = $2x$.
9 added to twice of the whole number = $9 + 2x$.
From the given information, we have
 $9 + 2x = 31$
i.e. $2x = 31 - 9 = 22$
i.e. $x = 11$
Thus, the required whole numbers is 11.

Q26. A square has an angle of rotation of
(a) 50°
(b) 180°
(c) 90°
(d) 60°

Sol. (c)
For regular polygon,
Angle of rotation = $\frac{360^\circ}{\text{Number of sides}}$
i.e., Angle of rotation for a square = $\frac{360^\circ}{4} = 90^\circ$

Q27. A 2D skeleton outline used to make a 3D shape is called which of the terms listed below?
(a) Net
(b) Sketch
(c) Outline
(d) Border

Sol. (a)
A 2D skeleton outline used to make a 3D shape is called a net of the solid.

Q28. The linear equation $p/3 = q$ can be written in statement form as
(a) 3 times p is q
(b) One – third of p is q
(c) q times p is 3
(d) one – ninth of q is p

Sol. (b)
The given equation can be written in the form of a statement as 'One third of p is q '.

Q29. Area of a circle whose radius is 5 cm is _____ cm^2
(a) $20 \pi \text{ cm}^2$
(b) $25 \pi \text{ cm}^2$
(c) $30 \pi \text{ cm}^2$
(d) None of these

Sol. (b)

Area of circle = πr^2

Here, $r = 5 \text{ cm} \Rightarrow \text{Area} = 25 \pi \text{ cm}^2$

Area of a circle whose radius is 5 cm is $25\pi \text{ cm}^2$

Q30. A rectangular park is 38 m long and 15 m wide. A path 3.5 m wide is constructed outside the park. Find the outer perimeter of the path.

(a) 130 m

(b) 124 m

(c) 128 m

(d) 130 m

Sol. (d)

The above data can be shown in a figure as follows:

Let PQRS represent the rectangular park and the shaded region represent the path which is 3.5 m wide.

Thus, to find the length AB and breadth BC, we have to add 3.5 m to both sides of rectangular park whose dimensions are 38×15 .

So, the length and breadth of the path are as shown below:

Length, $AB = (38 + 3.5 + 3.5) \text{ m} = 45 \text{ m}$

Breadth, $BC = (15 + 3.5 + 3.5) \text{ m} = 22 \text{ m}$

So, outer perimeter of the path = $2(l + b) = 2(45 + 22) = 2 \times 67 = 134 \text{ m}$

Thus, outer perimeter of the path is 134 m.

