Post-Mid Term

SOLUTIONS

1. **(c) :** We know that angle of incidence = angle of reflection.

$\therefore$ $\angle AQP = \angle BQR = x$ (say) and $\angle PQR = 116°$ (Given)

Now, $x + 116° + x = 180°$

$\Rightarrow$ $2x = 64°$ $\Rightarrow$ $x = 32°$

$\therefore$ $\angle AQP = 32°$

2. **(d) :** Given, abscissa of the point = $\dfrac{1}{2}$ = 0.5

Ordinate of the point = $\dfrac{-3}{4}$ = – 0.75

$\therefore$ The coordinates of the point are (0.5, –0.75)

3. **(b) :** The sum of opposite angles of a cyclic quadrilateral is 180°.

4. The decimal representation of an irrational number is neither terminating nor repeating.

5. Here, side of an equilateral triangle = '2a' units.

Now, area of equilateral triangle with side '2a' = $\dfrac{\sqrt{3}}{4}$ (side)^2

= $\dfrac{\sqrt{3}}{4}$ $(2a)^2$ sq. units = $\sqrt{3}\, a^2$

6. Let the fourth angle be x.

Since, sum of angles of a quadrilateral is 360°.

$\therefore$ $120° + 60° + 55° + x = 360°$

$\Rightarrow$ $x = 360° – (120° + 60° + 55°)$

$\Rightarrow$ $x = 360° – 235° = 125°$

7. As per given bar graph, the highest bar is of Nick channel while smallest bar is of Disney channel.

Number of children who watched Nick channel = 120

Number of children who watched Disney channel = 60

Hence, the required ratio = 60 : 120 = 1 : 2

8. Given, $x^2 – 3x – 1 = 0$

$\Rightarrow$ $x^2 – 3x = 1$

$\Rightarrow$ $x(x – 3) = 1$

$\Rightarrow$ $x – 3 = 1/x$
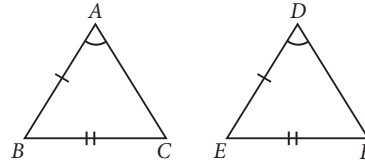
$\Rightarrow$ $x – 1/x = 3$ ...(i)

Now, $\left(x - \dfrac{1}{x}\right)^2 = x^2 + \dfrac{1}{x^2} - 2$

$\Rightarrow$ $3^2 = x^2 + \dfrac{1}{x^2} - 2$ [Using (i)]

$\Rightarrow$ $9 + 2 = x^2 + \dfrac{1}{x^2}$ $\Rightarrow$ $x^2 + \dfrac{1}{x^2} = 11$

9.

In $\triangle ABC$ and $\triangle DEF$,

$AB = DE$ (Given)

$BC = EF$ (Given)

and $\angle A = \angle D$, which is not included angle between corresponding equal sides.

Thus, $\triangle ABC$ is not congruent to $\triangle DEF$.

10. Let $\angle R = 3x$ and $\angle S = 2x$

Now, $\angle P + \angle Q + \angle R + \angle S = 360°$

(By angle sum property of a quadrilateral)

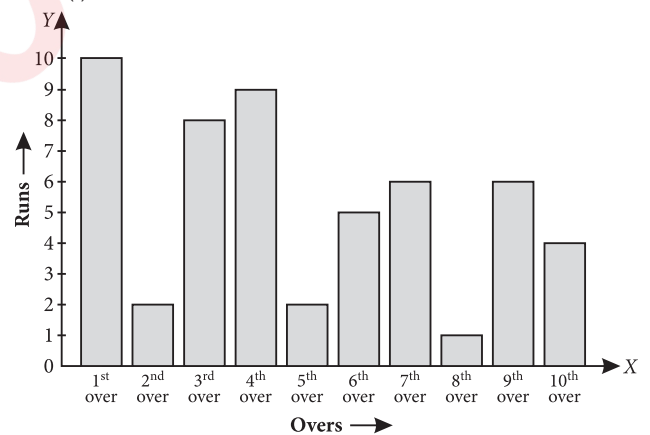$\Rightarrow$ $250° + 3x + 2x = 360° \Rightarrow 5x = 110° \Rightarrow x = 22°$

$\therefore$ $\angle R = 3x = 3 \times 22° = 66°$

$\angle S = 2x = 2 \times 22° = 44°$

Now, $\angle R – \angle S = 66° – 44° = 22°$

11. (i)

(ii) Total runs scored = 10 + 2 + 8 + 9 + 2 + 5 + 6 + 1 + 6 + 4 = 53

12. Length of the pipe, h = 30 cm

External radius of the pipe, $R = \dfrac{35}{2}$ cm = 17.5 cm

$\because$ Thickness of the pipe = 2.5 cm

$\therefore$ Internal radius of the pipe, r = (17.5 – 2.5) cm = 15 cm

Now, curved surface area of the pipe = External curved surface area + Internal curved surface area

= $2\pi Rh + 2\pi rh = 2\pi h (R + r)$

= $2 \times \dfrac{22}{7} \times 30(17.5 + 15) = 2 \times \dfrac{22}{7} \times 30 \times 32.5$

$= \dfrac{42900}{7} = 6128.57 \text{ cm}^2$

13. (i) We have, $x = -7 \Rightarrow x + 7 = 0$

$\Rightarrow \quad 1\,x + 0 \cdot y + 7 = 0$

(ii) We have, $y = 3 \Rightarrow y - 3 = 0$

$\Rightarrow \quad 0 \cdot x + 1\,y - 3 = 0$

(iii) We have, $4x = 3 \Rightarrow 4x - 3 = 0 \Rightarrow 4x + 0 \cdot y - 3 = 0$

(iv) We have, $6y = 5 \Rightarrow 6y - 5 = 0 \Rightarrow 0 \cdot x + 6y - 5 = 0$

$= 325 + 450 + 225 + 150 + 200 + 50 + 125 + 300 + 400 = 2225$

14. Aman, Sahil and Dinesh form an equilateral triangle.

Let the length of each side of the equilateral triangle be $2x$ metres.
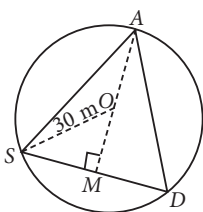
Draw $AM \perp SD$.

Since ΔASD is equilateral,

$\therefore \quad AM$ passes through O.

$\Rightarrow \quad SM = \dfrac{1}{2} SD = \dfrac{1}{2}(2x)$

$\Rightarrow \quad SM = x$

Now, in right ΔASM, we have

$AM^2 + SM^2 = AS^2$

$\Rightarrow \quad AM^2 = AS^2 - SM^2 = (2x)^2 - x^2 = 4x^2 - x^2 = 3x^2$

$\Rightarrow \quad AM = \sqrt{3}x$

Now, $OM = AM - OA = (\sqrt{3}x - 30)\,\text{m}$

Again, in right ΔOSM, we have

$OS^2 = SM^2 + OM^2$

$30^2 = x^2 + (\sqrt{3}x - 30)^2$

$\Rightarrow \quad 900 = x^2 + 3x^2 - 60\sqrt{3}x + 900$

$\Rightarrow \quad 4x^2 = 60\sqrt{3}x \Rightarrow 4x = 60\sqrt{3} \Rightarrow x = 15\sqrt{3}\,\text{m}$

Now, $SD = 2x = 2 \times 15\sqrt{3}\,\text{m} = 30\sqrt{3}\,\text{m}$

Thus, the distance between each of them $= 30\sqrt{3}\,\text{m}$

15. (i) The bar graph represents the number of vehicles passing through a particular crossing of Gurgaon in different time intervals on a particular day.

(ii) The maximum traffic is between 9-10 hrs. The number of vehicles passed in this hour is 450.

(iii) The minimum traffic is between 13-14 hrs. The number of vehicles passed during this hour is 50.

(iv) The total number of vehicles passing through a crossing during a particular day

$= 325 + 450 + 225 + 150 + 200 + 50 + 125 + 300 + 400$

$= 2225$

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