



Exercise 14B

Q1.

Answer :

(a) 5

For a pentagon:

$$n = 5$$

$$\text{Number of diagonals} = \frac{n(n-3)}{2} = \frac{5(5-3)}{2} = 5$$

Q2.

Answer :

(c) 9

$$\text{Number of diagonals in an } n\text{-sided polygon} = \frac{n(n-3)}{2}$$

For a hexagon:

$$n = 6$$

$$\begin{aligned}\therefore \frac{n(n-3)}{2} &= \frac{6(6-3)}{2} \\ &= \frac{18}{2} = 9\end{aligned}$$

Q3.

Answer :

(d) 20

For a regular n -sided polygon:

$$\text{Number of diagonals} =: \frac{n(n-3)}{2}$$

For an octagon:

$$n = 8$$

$$\frac{8(8-3)}{2} = \frac{40}{2} = 20$$

Q4.

Answer :

(d) 54

For an n-sided polygon:

$$\text{Number of diagonals} = \frac{n(n-3)}{2}$$

$$\therefore n = 12$$

$$\Rightarrow \frac{12(12-3)}{2} = 54$$

Q5.

Answer :

(c) 9

$$\frac{n(n-3)}{2} = 27$$

$$\Rightarrow n(n-3) = 54$$

$$\Rightarrow n^2 - 3n - 54 = 0$$

$$\Rightarrow n^2 - 9n + 6n - 54 = 0$$

$$\Rightarrow n(n-9) + 6(n-9) = 0$$

$$\Rightarrow n = -6 \text{ or } n = 9$$

Number of sides cannot be negative.

$$\therefore n = 9$$

Q6.

Answer :

(b) 68°

Sum of all the interior angles of a polygon with n sides = $(n - 2) \times 180^\circ$

$$\therefore (5 - 2) \times 180^\circ = x + x + 20 + x + 40 + x + 60 + x + 80$$

$$\Rightarrow 540 = 5x + 200$$

$$\Rightarrow 5x = 340$$

$$\Rightarrow x = 68^\circ$$

Q7.

Answer :

(b) 9

Each exterior angle of a regular n -sided polygon = $\frac{360}{n} = 40$

$$\Rightarrow n = \frac{360}{40} = 9$$

Q8.

Answer :

(c) 5

Each interior angle of a regular n -sided polygon = $180 - \left(\frac{360}{n}\right)$

$$180 - \left(\frac{360}{n}\right) = 108$$

$$\Rightarrow \left(\frac{360}{n}\right) = 72$$

$$\Rightarrow n = \frac{360}{72} = 5$$

Q9.

Answer :

(a) 8

Each interior angle of a regular polygon with n sides = $180 - \left(\frac{360}{n}\right)$

$$\Rightarrow 180 - \left(\frac{360}{n}\right) = 135$$

$$\Rightarrow \frac{360}{n} = 45$$

$$\Rightarrow n = 8$$

Q10.

Answer :

(b) 8

For a regular polygon with n sides:

$$\text{Each exterior angle} = \frac{360}{n}$$

$$\text{Each interior angle} = 180 - \frac{360}{n}$$

$$\therefore 180 - \frac{360}{n} = 3\left(\frac{360}{n}\right)$$

$$\Rightarrow 180 = 4\left(\frac{360}{n}\right)$$

$$\Rightarrow n = \frac{4 \times 360}{180} = 8$$

Q11.

Answer :

(c) 144°

$$\text{Each interior angle of a regular decagon} = 180 - \frac{360}{10} = 180 - 36 = 144^\circ$$

Q12.

Answer :

(b) 8 *right* \angle s

Sum of all the interior angles of a hexagon is $(2n - 4)$ right angles.

For a hexagon:

$$n = 6$$

$$\Rightarrow (2n - 4) \text{ right } \angle\text{s} = (12 - 4) \text{ right } \angle\text{s} = 8 \text{ right } \angle\text{s}$$

Q13.

Answer :

(a) 135°

$$(2n - 4) \times 90 = 1080$$

$$(2n - 4) = 12$$

$$2n = 16$$

$$\text{or } n = 8$$

$$\text{Each interior angle} = 180 - \frac{360}{n} = 180 - \frac{360}{8} = 180 - 45 = 135^\circ$$

***** END *****