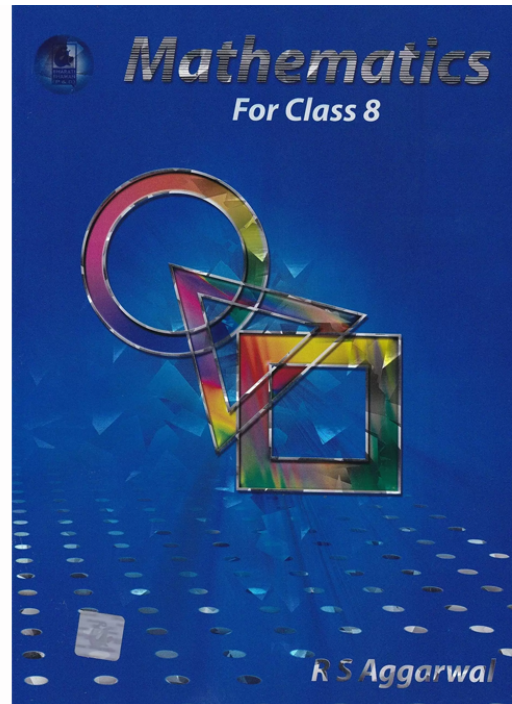


RS Aggarwal Solutions for Class 8

Maths Chapter 14–Polygons

Class 8 - Chapter 14 Polygons



For any clarifications or questions you can write to info@indcareer.com

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Ex 14A

Q1.

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Answer :

Exterior angle of an n -sided polygon = $\left(\frac{360}{n}\right)^{\circ}$

(i) For a pentagon: $n = 5$

$$\therefore \left(\frac{360}{n}\right) = \left(\frac{360}{5}\right) = 72^{\circ}$$

(ii) For a hexagon: $n = 6$

$$\therefore \left(\frac{360}{n}\right) = \left(\frac{360}{6}\right) = 60^{\circ}$$

(iii) For a heptagon: $n = 7$

$$\therefore \left(\frac{360}{n}\right) = \left(\frac{360}{7}\right) = 51.43^{\circ}$$

(iv) For a decagon: $n = 10$

$$\therefore \left(\frac{360}{n}\right) = \left(\frac{360}{10}\right) = 36^{\circ}$$

(v) For a polygon of 15 sides: $n = 15$

$$\therefore \left(\frac{360}{n}\right) = \left(\frac{360}{15}\right) = 24^{\circ}$$

Q2.

Answer :

Each exterior angle of an n -sided polygon = $\left(\frac{360}{n}\right)^{\circ}$

If the exterior angle is 50° , then:

$$\begin{aligned}\frac{360}{n} &= 50 \\ \Rightarrow n &= 7.2\end{aligned}$$

Since n is not an integer, we cannot have a polygon with each exterior angle equal to 50° .

Q3.

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Q4.

Answer :

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

If each interior angle of the polygon is 100° , then:

$$100 = \frac{180n - 360}{n}$$

$$\Rightarrow 100n = 180n - 360$$

$$\Rightarrow 180n - 100n = 360$$

$$\Rightarrow 80n = 360$$

$$\Rightarrow n = \frac{360}{80} = 4.5$$

Since n is not an integer, it is not possible to have a regular polygon with each interior angle equal to 100° .

Q5.

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Answer :

Sum of the interior angles of an n -sided polygon = $(n - 2) \times 180^\circ$

(i) For a pentagon:

$$n = 5$$

$$\therefore (n - 2) \times 180^\circ = (5 - 2) \times 180^\circ = 3 \times 180^\circ = 540^\circ$$

(ii) For a hexagon:

$$n = 6$$

$$\therefore (n - 2) \times 180^\circ = (6 - 2) \times 180^\circ = 4 \times 180^\circ = 720^\circ$$

(iii) For a nonagon:

$$n = 9$$

$$\therefore (n - 2) \times 180^\circ = (9 - 2) \times 180^\circ = 7 \times 180^\circ = 1260^\circ$$

(iv) For a polygon of 12 sides:

$$n = 12$$

$$\therefore (n - 2) \times 180^\circ = (12 - 2) \times 180^\circ = 10 \times 180^\circ = 1800^\circ$$

Q6.

Answer :

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

(i) For a heptagon:

$$n = 7 \Rightarrow \frac{n(n-3)}{2} = \frac{7(7-3)}{2} = \frac{28}{2} = 14$$

(ii) For an octagon:

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

(iii) For a 12-sided polygon:

$$n = 12 \Rightarrow \frac{n(n-3)}{2} = \frac{12(12-3)}{2} = \frac{108}{2} = 54$$

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Q7.

Answer :

Sum of all the exterior angles of a regular polygon is 360° .

(i)

Each exterior angle = 40°

Number of sides of the regular polygon = $\frac{360}{40} = 9$

(ii)

Each exterior angle = 36°

Number of sides of the regular polygon = $\frac{360}{36} = 10$

(iii)

Each exterior angle = 72°

Number of sides of the regular polygon = $\frac{360}{72} = 5$

(iv)

Each exterior angle = 30°

Number of sides of the regular polygon = $\frac{360}{30} = 12$

Q8.

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Answer :

Sum of all the interior angles of an n-sided polygon = $(n - 2) \times 180^\circ$

$$m\angle ADC = 180 - 50 = 130^\circ$$

$$m\angle DAB = 180 - 115 = 65^\circ$$

$$m\angle BCD = 180 - 90 = 90^\circ$$

$$m\angle ADC + m\angle DAB + m\angle BCD + m\angle ABC = (n - 2) \times 180^\circ = (4 - 2) \times 180^\circ = 2 \times 180^\circ = 360^\circ$$

$$\Rightarrow m\angle ADC + m\angle DAB + m\angle BCD + m\angle ABC = 360^\circ$$

$$\Rightarrow 130^\circ + 65^\circ + 90^\circ + m\angle ABC = 360^\circ$$

$$\Rightarrow 285^\circ + m\angle ABC = 360^\circ$$

$$\Rightarrow m\angle ABC = 75^\circ$$

$$\Rightarrow m\angle CBF = 180 - 75 = 105^\circ$$

$$\therefore x = 105$$

Q9.

Answer :

For a regular n-sided polygon:

$$\text{Each interior angle} = 180 - \left(\frac{360}{n}\right)$$

In the given figure:

$$n = 5$$

$$x^\circ = 180 - \frac{360}{5}$$

$$= 180 - 72$$

$$= 108^\circ$$

$$\therefore x = 108$$

Ex 14B

Q1.

Q2.

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[s/](#)

Answer :

(c) 9

Number of diagonals in an n-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:

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:

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

$$\therefore n = 12$$

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

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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.

Q8.

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[s/](#)

Answer :

(c) 5

Each interior angle for 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:

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

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.

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Answer :

(c) 144°

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

Q12.

Answer :

(b) $8 \text{ right } \angle\text{s}$

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°

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

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

$$2n = 16$$

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

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

Q14.

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Difference between each interior and exterior angle = 108°

Then each interior angle = $x + 108^\circ$

$$x + x + 108^\circ = 180^\circ$$

(Sum of both angles = 180°)

$$\Rightarrow 2x = 180^\circ - 108^\circ = 72^\circ$$

$$x = \frac{72}{2}$$

$$= 36^\circ$$

$$\text{No. of sides} = \frac{360^\circ}{36^\circ}$$

$$= 10 \text{ (d)}$$



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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

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