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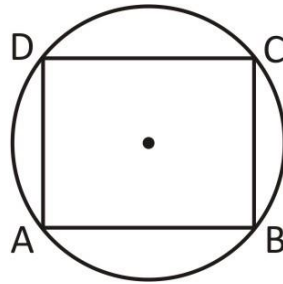
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Quadrilateral & Polygon Questions for CDS, SSC & Railways Exams

Quadrilateral & Polygon Quiz 3

Directions: Kindly study the following questions carefully and choose the right answer:

1. In a cyclic quadrilateral $\angle A + \angle C = \angle B + \angle D = ?$



- A. 270° B. 360° C. 90° D. 180°

2. If ABCD be a cyclic quadrilateral in which $\angle A = 4x^\circ$, $\angle B = 7x^\circ$, $\angle C = 5y^\circ$, $\angle D = y^\circ$, then $x : y$ is

- A. 3 : 4 B. 4 : 3 C. 5 : 4 D. 4 : 5

3. A quadrilateral ABCD circumscribes a circle and $AB = 6$ cm, $CD = 5$ cm and $AD = 7$ cm. The length of side BC is

- A. 4 cm B. 5 cm C. 3 cm D. 6 cm

4. ABCD is a cyclic quadrilateral and AD is a diameter. If $\angle BAC = 55^\circ$ then value of $\angle ADC$ is

- A. 55° B. 35° C. 145° D. 125°

5. The difference between the exterior and interior angles at a vertex of a regular polygon is 150° . The number of sides of the polygon is

- A. 10 B. 15 C. 24 D. 30

6. Each interior angle of a regular polygon is 144° . The number of sides of the polygon is

A. 8 B. 9 C. 10 D. 11

7. If the sum of the interior angles of a regular polygon be 1080° , the number of sides of the polygon is

A. 6 B. 8 C. 10 D. 12

8. The number of sides in two regular polygons are in the ratio 5 : 4 and the difference between each interior angle of the polygons is 6° . Then the number of sides are

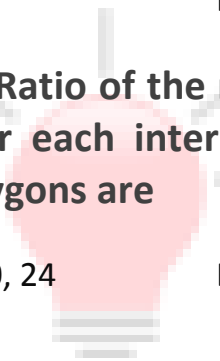
A. 15, 12 B. 5, 4 C. 10, 8 D. 20, 16

9. Each interior angle of a regular polygon is two times its external angle. Then the number of sides of the polygon is :

A. 8 B. 6 C. 5 D. 7

10. Ratio of the number of sides of two regular polygons is 5 : 6 and the ratio of their each interior angle is 24 : 25. Then the number of sides of these two polygons are

A. 20, 24 B. 15, 18 C. 10, 12 D. 5, 6



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Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	B	A	C	C	C	B	A	B	C

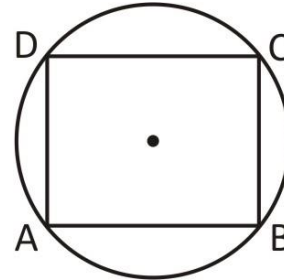
Explanations:

1.

The sum of opposite angles of a concyclic quadrilateral = 180°

$$\therefore \angle A + \angle C = \angle B + \angle D = 180^\circ$$

Hence, option D is correct.



2.

The sum of opposite angles of a concyclic quadrilateral is 180° .

$$\therefore \angle A + \angle C = 180^\circ$$

$$4x + 5y = 180^\circ \quad \dots(i)$$

$$\angle B + \angle D = 180^\circ$$

$$7x + y = 180^\circ \quad \dots(ii)$$

By equation (ii) $\times 5 - (i)$, we get

$$31x = 720 \Rightarrow x = \frac{720}{31}$$

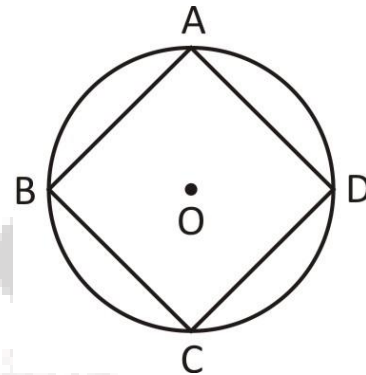
From equation (ii),

$$7x + y = 180^\circ \Rightarrow 7 \times \frac{720}{31} + y = 180^\circ$$

$$y = 180^\circ - \frac{5040}{31} = \frac{540}{31}$$

$$\therefore x : y = \frac{720}{31} : \frac{540}{31} = 4 : 3$$

Hence, option B is correct.



3.

We know tangents drawn to a circle from same external point are equal

$$AM = AQ = x \text{ (let)}$$

$$\therefore MB = 6 - x = BN$$

$$QD = 7 - x = DP$$

$$PC = y \text{ (let)} = CN$$

$$\text{Now, } CD = DP + PC = 5$$

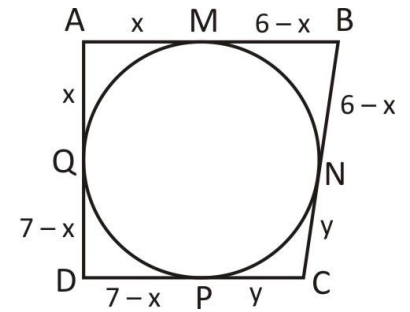
$$\Rightarrow 7 - x + y = 5$$

$$\Rightarrow y - x = -2$$

$$BC = CN + BN$$

$$= y + 6 - x = y - x + 6 = -2 + 6 = 4$$

Hence, option A is correct.



4.

$$\angle BAC = 55^\circ$$

$$\angle ACB = 90^\circ$$

[\because Angle of semi-circle]

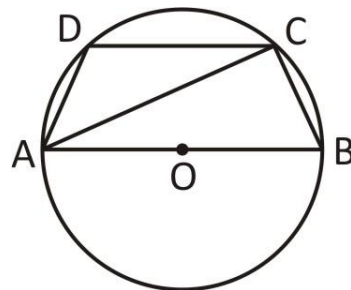
In $\triangle ABC$, we know that

$$\angle ABC = 180^\circ - 90^\circ - 55^\circ = 35^\circ$$

$$\therefore \angle ABC + \angle ADC = 180^\circ$$

$$\angle ADC = 180^\circ - \angle ABC = 180^\circ - 35^\circ = 145^\circ$$

Hence, option C is correct.



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5.

Let the number of sides of a polygon be n . Then,

$$180^\circ - \frac{360^\circ}{n} - \frac{360^\circ}{n} = 150^\circ$$

$$180^\circ \times n - 720^\circ = 150^\circ \times n$$

$$30^\circ \times n = 720^\circ$$

$$n = 24$$

Hence, option C is correct.

6.

If the number of sides of a polygon be n . Then,

$$180^\circ - \frac{360^\circ}{n} = 144^\circ$$

$$180^\circ \times n - 360^\circ = 144^\circ \times n$$

$$36^\circ \times n = 360^\circ$$

$$n = 10$$

Hence, option C is correct.

7.

We know that,

Sum of the interior angles of a regular polygon of n sides = $(2n - 4) \times 90^\circ$

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

$$2n - 4 = 12$$

$$2n = 16 \Rightarrow n = 8$$

Hence, option B is correct.

8.

Let the number of sides be $5x$ and $4x$ respectively.

$$\therefore \left(180^\circ - \frac{360^\circ}{5x}\right) - \left(180^\circ - \frac{360^\circ}{4x}\right) = 6^\circ$$

$$180^\circ - \frac{360^\circ}{5x} - 180^\circ + \frac{360^\circ}{4x} = 6^\circ$$

$$\frac{-1440^\circ + 1800^\circ}{20x} = 6^\circ$$

$$120^\circ x = 360^\circ$$

$$x = 3$$

$$\therefore \text{Number of sides} = 5x = 5 \times 3 = 15 \quad \text{and} \quad 4x = 4 \times 3 = 12.$$

Hence, option A is correct.

9.

Let the number of sides of a regular polygon be n .

$$\therefore 180^\circ - \frac{360^\circ}{n} = 2 \times \frac{360^\circ}{n}$$

$$180^\circ \times n - 360^\circ = 720^\circ$$

$$180^\circ \times n = 1080^\circ$$

$$n = 6$$

Hence, option B is correct.

10.

Let the number of sides be $5x$ and $6x$ respectively. Then,

$$\left(180^\circ - \frac{360^\circ}{5x}\right) : \left(180^\circ - \frac{360^\circ}{6x}\right) = 24 : 25$$

$$\frac{180^\circ (5x - 2)}{5x} \times \frac{6x}{360^\circ (3x - 1)} = \frac{24}{25}$$

$$75x - 30 = 72x - 24$$

$$3x = 6$$

$$x = 2$$

$$\therefore \text{Number of sides} = 5x = 5 \times 2 = 10 \quad \text{and} \quad 6x = 6 \times 2 = 12$$

Hence, option C is correct.



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