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Circle Questions for CDS, SSC & Railways Exams

Circle Quiz 2

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

1. Two equal circles of radius 4 cm intersect each other such that each passes through the centre of the other. The length of the common chord is :

- A. $2\sqrt{3}$ cm B. $4\sqrt{3}$ cm C. $2\sqrt{2}$ cm D. 8 cm

2. The largest chord of a circle is known to be 10.1 cm. The radius of this circle must be :

- A. 5 cm B. greater than 5 cm C. greater than or equal to 5 cm
D. less than 5 cm

3. The length of the chord of a circle is 8 cm and perpendicular distance between centre and the chord is 3 cm. Then the radius of the circle is equal to :

- A. 4 cm B. 5 cm C. 6 cm D. 8 cm

4. The length of a chord of a circle is equal to the radius of the circle. The angle which this chord subtends in the major segment of the circle is equal to

- A. 30° B. 45° C. 60° D. 90°

5. AB = 8 cm and CD = 6 cm are two parallel chords on the same side of the centre of a circle. The distance between them is 1 cm. The radius of the circle is

- A. 5 cm B. 4 cm C. 3 cm D. 2 cm

6. The length of two chords AB and AC of a circle are 8 cm and 6 cm and $\angle BAC = 90^\circ$, then the radius of circle is

- A. 25 cm B. 20 cm C. 4 cm D. 5 cm

7. The distance between two parallel chords of length 8 cm each in a circle of diameter 10 cm is

- A. 6 cm B. 7 cm C. 8 cm D. 5.5 cm

8. The length of the common chord of two intersecting circles is 24 cm. If the diameter of the circles are 30 cm and 26 cm, then the distance between the centre (in cm) is

- A. 13 B. 14 C. 15 D. 16

9. In a circle of radius 21 cm, an arc subtends an angle of 72° at the centre. The length of the arc is

- A. 21.6 cm B. 26.4 cm C. 13.2 cm D. 19.8 cm

10. A unique circle can always be drawn through x number of given non-collinear points, then x must be

- A. 2 B. 3 C. 4 D. 1



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Correct Answers:

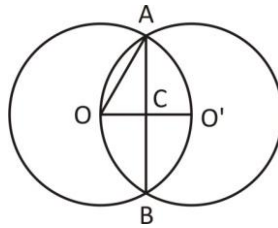
1	2	3	4	5	6	7	8	9	10
B	B	B	A	A	D	A	B	B	B

Explanations:

1.

Radius, $OA = 4$ cm

$\therefore OC = 2$ cm



By Pythagoras theorem in ΔAOC ,

$$\therefore AC = \sqrt{4^2 - 2^2} = \sqrt{12} = 2\sqrt{3} \text{ cm}$$

$$\therefore AB = 2\sqrt{3} + 2\sqrt{3} = 4\sqrt{3} \text{ cm}$$

Hence, option B is correct.

2.

The largest chord of a circle is its diameter. So,

$$\text{Radius} = \frac{\text{Diameter}}{2} = \frac{10.1}{2} = 5.05 \text{ cm}$$

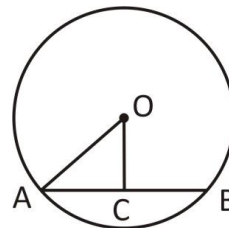
Hence, option B is correct.

3.

Chord, $AB = 8$ cm

Then, $AC = CB = 4$ cm

Perpendicular distance between centre and chord,



$OC = 3$ cm

$$\therefore OA = \sqrt{(OC^2 + AC^2)}$$

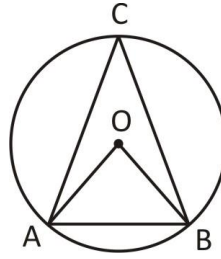
$$= \sqrt{3^2 + 4^2} = \sqrt{25} = 5 \text{ cm}$$

Hence, option B is correct.

4.

$$AO = OB = AB$$

$$\Rightarrow \angle AOB = 60^\circ \quad [\because \triangle AOB \text{ is equilateral}]$$



Note : The angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

$$\therefore \angle ACB = 30^\circ$$

Hence, option A is correct.

5.

Given, Chords $AB = 8 \text{ cm}$ and $CD = 6 \text{ cm}$

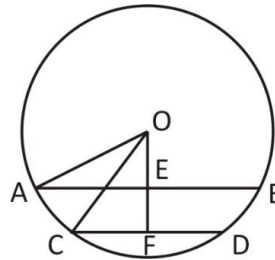
Then, $AE = EB = 4 \text{ cm}$ and $CF = FD = 3 \text{ cm}$

$$EF = 1 \text{ cm}$$

Let $OE = x \text{ cm}$

Then, $OF = (x + 1) \text{ cm}$

$$OA = OC = r \text{ cm} \quad (\because \text{radius})$$



From $\triangle OAE$, By pythagoras theorem

$$OA^2 = AE^2 + OE^2$$

$$\Rightarrow r^2 = 4^2 + x^2$$

$$\Rightarrow x^2 = r^2 - 16 \quad \dots(i)$$

From $\triangle OCF$, By pythagoras theorem

$$OC^2 = CF^2 + OF^2$$

$$r^2 = 3^2 + (x + 1)^2$$

$$(x + 1)^2 = r^2 - 9 \quad \dots(ii)$$

By equation (ii) – (i),

$$(x + 1)^2 - x^2 = r^2 - 9 - r^2 + 16$$

$$\Rightarrow x^2 + 1 + 2x - x^2 = 7$$

$$\Rightarrow 2x = 7 - 1 = 6$$

$$\Rightarrow x = 3 \text{ cm}$$

\therefore From equation (i),

$$9 = r^2 - 16$$

$$\Rightarrow r^2 = 25$$

$$\Rightarrow r = 5 \text{ cm}$$

Hence, option A is correct.

6.

$$\angle BAC = 90^\circ$$

As, BC is the diameter of the circle.

$$\therefore BC = \sqrt{AB^2 + AC^2}$$

$$= \sqrt{8^2 + 6^2} = \sqrt{100} = 10 \text{ cm}$$

$$\therefore \text{Radius of the circle} = \frac{\text{Diameter}}{2} = \frac{10}{2} = 5 \text{ cm}$$

Hence, option D is correct.

7.

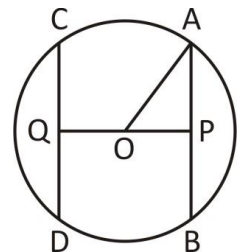
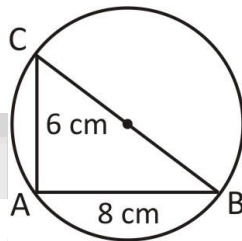
Given, Chord AB = Chord CD = 8 cm

Then, AP = PB = 4 cm and Diameter = 10 cm, then radius = 5 cm

Note : Equal chords of a circle (or of congruent circles) are equidistant from the centre.

$$\therefore OP = OQ$$

From $\triangle OAP$, By pythagoras theorem



$$OP = \sqrt{OA^2 - AP^2}$$

$$= \sqrt{5^2 - 4^2} = \sqrt{9} = 3 \text{ cm}$$

$$\therefore QP = 2 \times OP = 2 \times 3 = 6 \text{ cm}$$

Hence, option A is correct.

8.

Given, Common chord $AB = 24 \text{ cm}$

Then, $AD = DB = 12 \text{ cm}$

Diameter of circle of centre $O = 30 \text{ cm}$, Then radius $OA = 15 \text{ cm}$

And, Diameter of circle of centre $O' = 26 \text{ cm}$, Then radius $O'A = 13 \text{ cm}$

From $\triangle OAD$, By pythagoras theorem

$$OD = \sqrt{OA^2 - AD^2}$$

$$= \sqrt{15^2 - 12^2} = \sqrt{81} = 9 \text{ cm}$$

From $\triangle O'AD$, By pythagoras theorem

$$O'D = \sqrt{O'A^2 - AD^2}$$

$$= \sqrt{13^2 - 12^2} = \sqrt{25} = 5 \text{ cm}$$

$$\therefore OO' = OD + O'D = 9 + 5 = 14 \text{ cm}$$

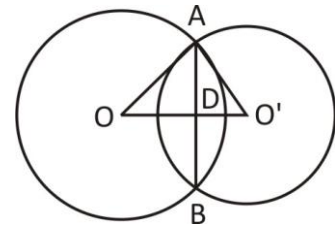
Hence, option B is correct.

9.

$$\theta = 72^\circ = 72 \times \frac{\pi}{180} \text{ radians} = \frac{2\pi}{5} \text{ radians}$$

We know that,

$$\text{length of arc} = \theta \times \text{radius}$$



$$= \frac{2\pi}{5} \times 21$$

$$= \frac{2}{5} \times \frac{22}{7} \times 21 = \frac{132}{5} = 26.4 \text{ cm}$$

Hence, option B is correct.

10.

A unique circle can always be drawn through x number of given non-collinear points, then x must be.

Hence, option B is correct.



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