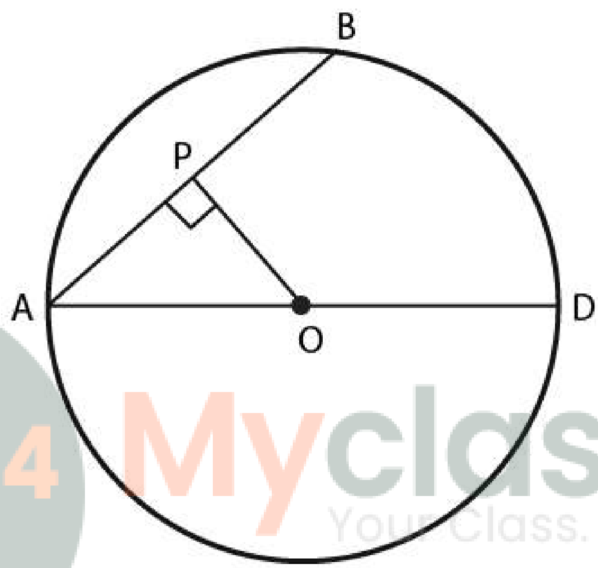
# EXERCISE 10.1

**AD is a diameter of a circle and AB is a chord. If AD = 34 cm, AB = 30 cm, the distance of AB from the centre of the circle is :**
**(A) 17 cm**
**(B) 15 cm**
**(C) 4 cm**
**(D) 8 cm**
**Solution:**



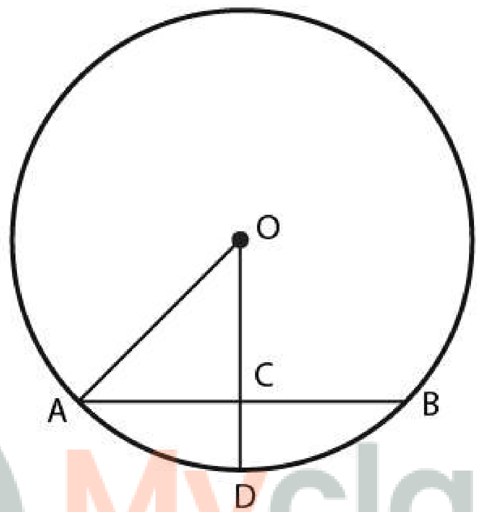



**(D) 8 cm**
Explanation:
Given: Diameter of the circle = d = AD = 34 cm
∴ Radius of the circle = r = d/2 = AO = 17 cm
Length of chord AB = 30 cm
Since the line drawn through the center of a circle to bisect a chord is perpendicular to the chord, therefore AOP is a right angled triangle with L as the bisector of AB.
∴ AP = 1/2(AB) = 15 cm
In right angled triangle AOB, by Pythagoras theorem, we have:
$(AO)^2 = (OP)^2 + (AP)^2$
$\Rightarrow (17)^2 = (OP)^2 + (15)^2$
$\Rightarrow (OP)^2 = (17)^2 - (15)^2$
$\Rightarrow (OP)^2 = 289 – 225$
$\Rightarrow (OP)^2 = 64$
Take square root on both sides:
$\Rightarrow (OP) = 8$
∴ The distance of AB from the center of the circle is 8 cm.
Hence, option D is the correct answer.

**2. In Fig. 10.3, if OA = 5 cm, AB = 8 cm and OD is perpendicular to AB, then CD is equal to:**
**(A) 2 cm**
**(B) 3 cm**
**(C) 4 cm**
**(D) 5 cm**
**Solution:**

**(A) 2 cm**

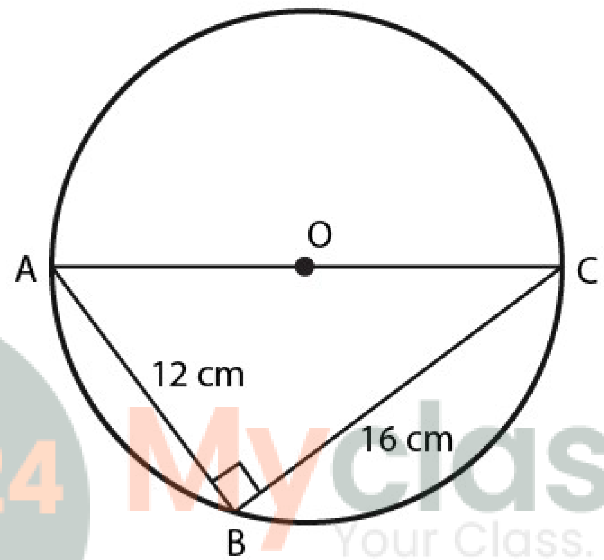
Explanation:






Given:
Radius of the circle = r = AO = 5 cm
Length of chord AB = 8 cm
Since the line drawn through the center of a circle to bisect a chord is perpendicular to the chord, therefore AOC is a right angled triangle with C as the bisector of AB.
∴ AC = ½ (AB) = 8/2 = 4 cm
In right angled triangle AOC, by Pythagoras theorem, we have:
$(AO)^2 = (OC)^2 + (AC)^2$
$\Rightarrow (5)^2 = (OC)^2 + (4)^2$
$\Rightarrow (OC)^2 = (5)^2 - (4)^2$
$\Rightarrow (OC)^2 = 25 - 16$
$\Rightarrow (OC)^2 = 9$
Take square root on both sides:
$\Rightarrow (OC) = 3$
∴ The distance of AC from the center of the circle is 3 cm.
Now, OD is the radius of the circle, ∴ OD = 5 cm
CD = OD – OC
CD = 5 – 3
CD = 2
Therefore, CD = 2 cm
Hence, option A is the correct answer.

**3. If AB = 12 cm, BC = 16 cm and AB is perpendicular to BC, then the radius of the circle passing through the points A, B and C is :**
**(A) 6 cm**
**(B) 8 cm**
**(C) 10 cm**
**(D) 12 cm**
**Solution:**
**(C) 10 cm**
Explanation:






According to the question,
AB = 12 cm, BC = 16 cm, AB ⊥ BC.
Therefore,
AC is the diameter of the circle passing through the points A, B and C.
Now, according to the figure,
We get,
ABC is a right angled triangle.
By Pythagoras theorem:
$(AC)^2 = (CB)^2 + (AB)^2$
$\Rightarrow (AC)^2 = (16)^2 + (12)^2$
$\Rightarrow (AC)^2 = 256 + 144$
$\Rightarrow (AC)^2 = 400$
Take square root on LHS and RHS,
We get,
(AC) = 20
Diameter of the circle = 20 cm
Thus, radius of the circle = Diameter/2
= 20/2
= 10 cm
Hence, Radius of the circle = 10 cm

Hence, option C is the correct answer.

**4. In Fig.10.4, if ∠ABC = 20º, then ∠AOC is equal to:**
**(A) 20º**
**(B) 40º**
**(C) 60º**
**(D) 10º**

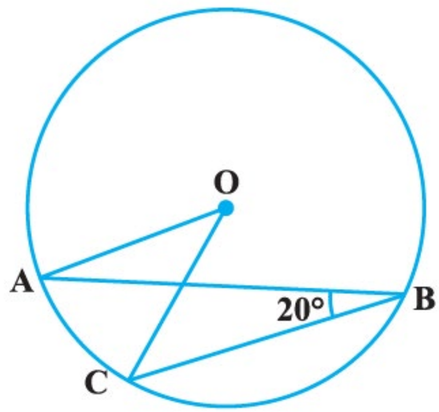



Fig. 10.4

**Solution:**

**(B) 40º**

Explanation:

According to the question,

∠ABC = 20°

We know that,

"The angle subtended by an arc at the center of a circle is twice the angle subtended by it at remaining part of the circle"

According to the theorem, we have,

∠AOC = 2 × ∠ABC

= 2 × 20°

= 40°

Therefore, ∠AOC = 40°

Hence, option B is the correct answer.

**5. In Fig.10.5, if AOB is a diameter of the circle and AC = BC, then ∠CAB is equal to:**
**(A) 30º**
**(B) 60º**
**(C) 90º**
**(D) 45º**

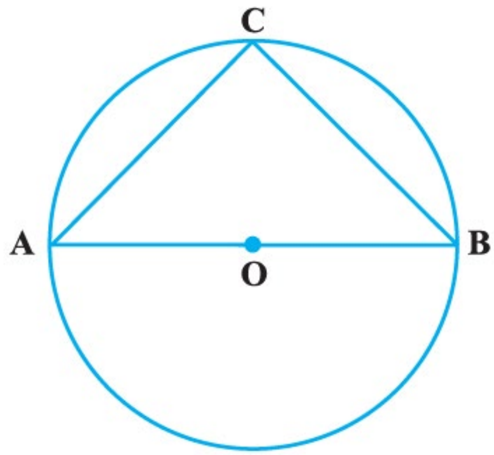



Fig. 10.5

**Solution:**

**(D) 45º**

Explanation:

According to the question,

We have,

Diameter of the circle = AOB

AC = BC

Since, angles opposite to equal sides are equal

∠ABC = ∠BAC

Let, ∠ABC = ∠BAC = x

Also, diameter subtends a right angle to the circle,

∠ACB = 90°

We also know that,

By angle sum property of a triangle, sum of all angles of a triangle = 180°.

∠CAB + ∠ABC + ∠ACB = 180°

⇒ x + x + 90° = 180°

⇒ 2x = 90°

⇒ x = 45°

∠CAB = ∠ ABC = 45°

Hence, option D is the correct answer.