Extra Questions

6. Circle

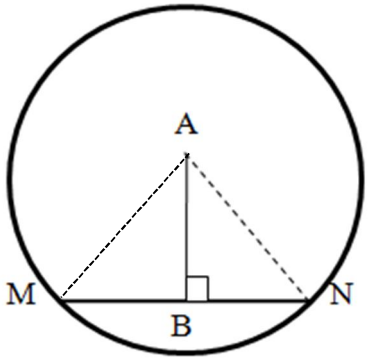
Q. 1) Radius of a circle is 13cm. The length of the chord is 10 cm. Find the distance of the chord from the Centre (3M)

Solution: - In the fig,

length of the chord, MN = 10 cm and centre of the circle is A.

Seg AB ⊥ chord MN

Perpendicular drawn from the centre of the circle on its chord bisects the chord



∴ MB = BN = 5cm

Radius of the circle is 13 cm…….. (Given)

In right angled triangle ABN,

$AB^2 + BN^2 = AN^2$ ... (by phythagoras theorem)

$AB^2 + (5)^2 = (13)^2$

$AB^2 = (13)^2 - (5)^2$

$AB^2 = 169 - 25$

$AB^2 = 144$

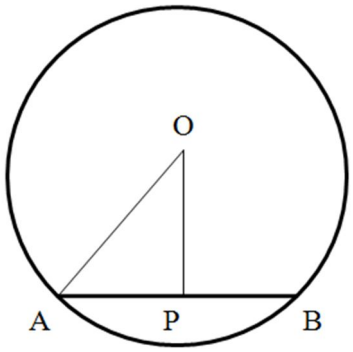
AB $= \sqrt{144} = 12$ cm

$\therefore$ Hence, the distance of the chord from the centre of the circle is 12 cm

Q.2) In the given figure, O is the Centre of the circle. If AB = 8cm and OP = 3cm, then find radius of the circle (3M)

Solution $\because$ seg OP $\perp$ seg AB

P is the center point of the AB



$AP = \frac{1}{2}AB$

$= \frac{1}{2} \times 8$ ……[AB = 8cm given]

$= 4$ cm

In the Δ OPA, To find OA

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

$= \sqrt{3^2 + 4^2}$

$= \sqrt{9 + 16}$

$= \sqrt{25}$

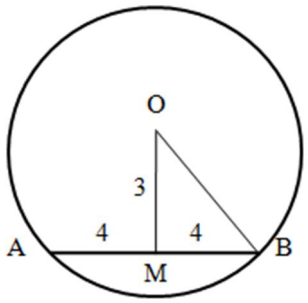
$= 5$ cm

$\therefore$ Seg OA = 5 cm

Radius of circle = 5 cm.

Q.3) The distance from the center O to the chord AB is 3cm. If the length of the chord AB is 8 cm. then find the diameter of circle. (3M)

Solution:



Given: chord AB = 8 cm

To find : Diameter of circle (d) = ?

Distance from center point of circle to chord·

$AB = AM + MB$

$= AM + AM$ ... ($\because AM = MB$)

$\therefore AB = 2AM$

$AM = MB = \frac{8}{2} = 4$ cm

In right angle Δ OMB] $\angle OMB = 90^0$

OM = 3 cm and MB = 4 cm

$OB^2 = OM^2 + MB^2$ ... (by Pythagoras theorem)

$\therefore OB^2 = (3)^2 + (4)^2$

$\therefore OB^2 = 9 + 16$

$\therefore OB^2 = 25$

$\therefore OB = 5$ cm

OB = Radius of circle = 5 cm

Diameter of circle $= 2 \times$ Radius

$= 2 \times 5$

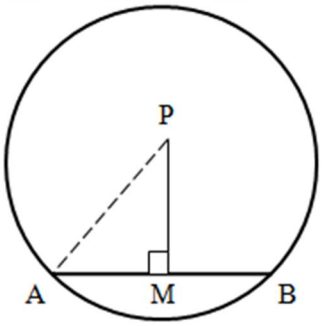
$= 10$ cm

$\therefore$ The diameter of circle is 10 cm.

Q.4) Radius of circle is 25 cm. length of the chord is 48 cm. find the distance from P(3M)

Solution:

Radius of the circle PA = 25 cm



$PM \perp AB$

PM bisect AB

$AM \cong MB$

$\therefore AM = MB = \frac{1}{2} AB = \frac{1}{2} \times 48 = 24$ cm

In right angle, ΔPMA, $\angle PMA = 90^0$

According to Pythagoras Theorem ,

$PA^2 = PM^2 + AM^2$

$(25)^2 = PM^2 + (24)^2$

$PM^2 = (25)^2 - (24)^2$

$PM^2 = (25 + 24)(25 - 24)$

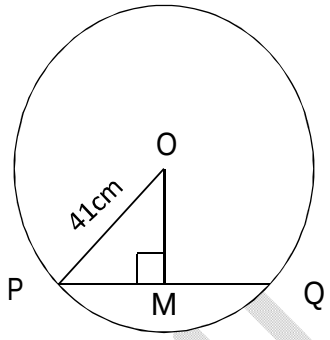
$PM^2 = (49) - (1)$

$PM = 7 \times 1$

PM = 7 cm

∴ Distance of the chord from the center is 7 cm.

Q.5) Radius of a circle with Centre O is 41 units. Length of a chord PQ is 80 units; find the distance of the chord from the Centre of the chord the center of the circle. (4M)



Ans : Let seg OM ⊥ chord PQ such that P-M-Q ,

PQ = 80 units, OP = 41 units

∴ PM = $\frac{1}{2}$ × 80

∴ PM = 40 units.

In right angled Δ OMP,

By Pythagoras theorem,

$OP^2 = OM^2 + PM^2$

$\therefore 41^2 = OM^2 + 40^2$

$\therefore OM^2 = 1681 - 1600$

$\therefore OM^2 = 1681 - 1600$

$\therefore OM^2 = 81$

$\therefore$ OM = $\sqrt{81}$

$\therefore$ OM = 9 units

$\therefore$ Distance of the chord from the centre is 9 units.