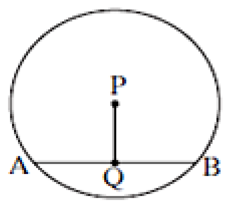
Circle : Chord And Arc

Practice set 17.1

Q. 1. In a circle with centre P, chord AB is drawn of length 13 cm, seg PQ ⊥ chord AB, then find *l*(QB).



Answer : We know that,

The perpendicular from the centre of a circle to a chord bisects the chord.

Therefore, it is given that,

AB = 13 cm

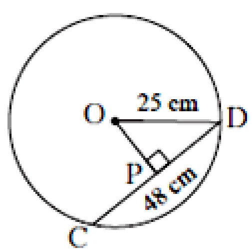
PQ perpendicular to AB

|(QB) = AB/2

| (QB) = 13/2

| (QB) = 6.5 cm

Q. 2. Radius of a circle with centre O is 25 cm. Find the distance of a chord from the centre if the length of the chord is 48 cm.



Answer : As we know that, the perpendicular from the centre of a circle to a chord bisects the chord.

Therefore, OP perpendicular to CD and OP bisects the CD. Therefore, it makes a right angle triangle, which is ∆OPD. We have OD=25 cm and PD=48/2=24 cm.

By Pythagoras theorem,

$OD^2 = OP^2 + PD^2$

$OP^2 = OD^2 - PD^2$

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

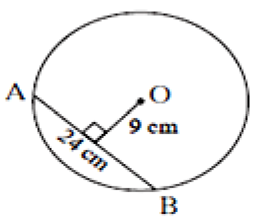
$OP^2 = 625 – 576$

$OP^2 = 49$

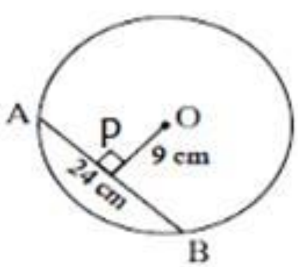
OP = 7 cm

Therefore, distance of the chord from the centre is 7 cm.

Q. 3. O is the centre of the circle. Find the length of the radius, if the chord of length 24 cm is at a distance of 9 cm from the centre of the circle.



Answer :



As we know that, the perpendicular from the centre of a circle to a chord bisects the chord.

So let P is the point, which bisects chord AB. So OP is perpendicular, it makes a right angle triangle ∆OPA.

Now we have OP = 9cm and AP as 12 cm

So by Pythagoras theorem,

$AO^2 = AP^2 + PO^2$

$AO^2 = (12)^2 + (9)^2$

$AO^2 = 144+81$

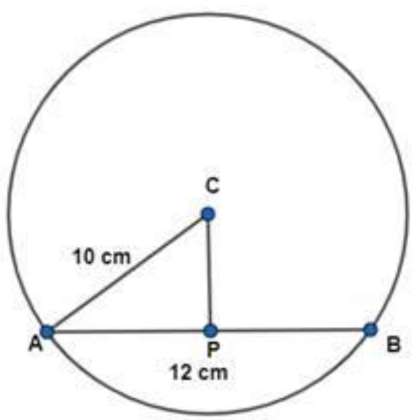
$AO^2 = 225$

AO = 15 cm

Length of radius is 15 cm.

Q. 4. C is the centre of the circle whose radius is 10 cm. Find the distance of the chord from the centre if the length of the chord is 12 cm.

Answer :



As we know that, the perpendicular from the centre of a circle to a chord bisects the chord.

So here we have C as a centre where CP is perpendicular on AB which bisects the chord AB and radius as CA = 10 cm and chord length = 12 cm, so AP=6cm.

It makes a right angle triangle ΔCPA.

Therefore, by using Pythagoras theorem, we have,

$AC^2 = CP^2 + AP^2$

We have to find CP so

$CP^2 = AC^2 - AP^2$

$CP^2 = (10)^2 – (6)^2$

$CP^2 = 100 – 36$

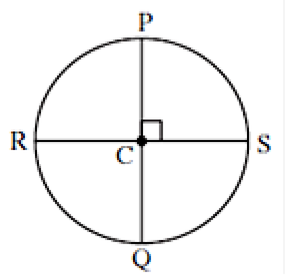
$CP^2 = 64$

CP = 8 cm

Therefore, a distance of the chord from the centre is 8 cm.

Practice set 17.2

Q. 1. The diameters PQ and RS of the circle with centre C are perpendicular to each other at C. State, why arc PS and arc SQ are congruent. Write the other arcs, which are congruent to arc PS

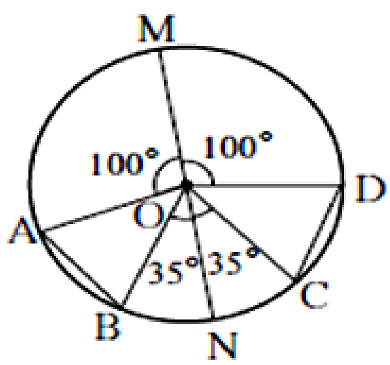


Answer : As we know that, according to the theorem of the circle, two arcs are congruent, if their central angles are congruent, so arc PS and arc SQ are congruent because the angles between the chords are same and both are at 90° of the centre.

The other arcs, which are congruent to arcs PS, are

arc PS ≅ arc PR ≅ arc RQ because if two arcs of a circle are congruent, then their corresponding arcs are also congruent.

Q. 2. In the adjoining figure O is the centre of the circle whose diameter is MN. Measures of some central angles are given in the figure. Hence, find the following



(1) m ∠AOB and m ∠COD
(2) Show that arc AB ≅ arc CD
(3) Show that chord AB ≅ chord CD

Answer : (1) In given figure, we can see that

$\angle NOC + \angle COD + \angle DOM = 180°$ (linear pair)

$35° + \angle COD + 100° = 180°$

$\angle COD = 180° - 135° = 45°$

So $\angle COD$ and $\angle AOB = 45°$

(2) arc AB ≅ arc CD because the arcs are of equal measure 45° each angle and equal angle made equal sector.

(3) Chord AB ≅ chord CD because corresponding chords of congruent arcs are congruent.