Exercise 11A

Question 15:

Two circles with centres A and B, having radii 5 cm and 3 cm touch each other internally.

The perpendicular bisector of AB meets the bigger circle in P and Q.

Join AP.

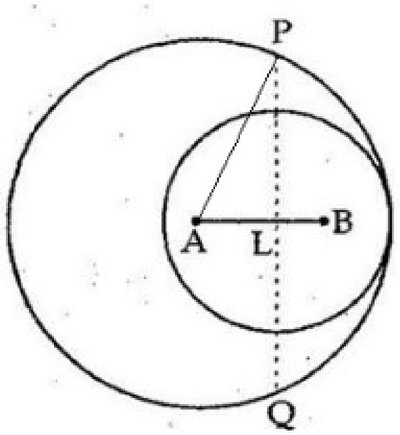
Let PQ intersect AB at L.

Then, $AB = (5-3)\text{ cm} = 2\text{ cm}$

Since PQ is the perpendicular bisector of AB, we have

$$AL = \frac{1}{2} \times AB$$

$$= \left(\frac{1}{2} \times 2\right)\text{cm} = 1\text{ cm}$$



Now, in right angle $\triangle PLA$

$\therefore \quad AP^2 = AL^2 + PL^2$

$\Rightarrow \quad PL = \sqrt{AP^2 - AL^2}\text{ cm}$

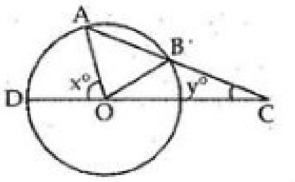
$= \sqrt{(25-1)}\text{ cm} = \sqrt{24}\text{ cm} = 2\sqrt{6}\text{ cm}$

$\therefore \quad PQ = (2 \times PL) = (2 \times 2\sqrt{6})\text{cm} = 4\sqrt{6}\text{ cm}$

$\therefore$ the length of $PQ = 4\sqrt{6}$ cm

Question 16:

Given: AB is a chord of a circle with centre O. AB is produced to C such that BC = OB. Also, CO is joined to meet the circle in D. $\angle ACD = y^\circ$ and $\angle AOD = x^\circ$.



To Prove : $x = 3y$

Proof : $OB = BC$ [Given]

$\therefore$ $\angle BOC = \angle BCO = y^\circ$ [isosceles triangle]

$\text{Ext.}\angle OBA = \angle BOC + \angle BCO = (2y)^\circ$

Again, $OA = OB$ [radii of same circle]

$\therefore$ $\angle OAB = \angle OBA = (2y)^\circ$ [isosceles triangle]

$\text{Ext.}\angle AOD = \angle OAC + \angle ACO$

$= \angle OAB + \angle BCO = 3y^\circ$

$\therefore$ $x^\circ = 3y^\circ$ [$\because \angle AOD = x$ (given)]

*********** END **********