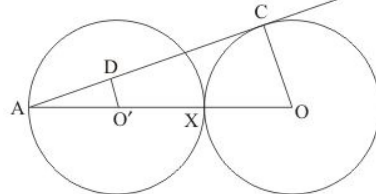




Circles Ex 10.2 Q29

Answer :

Consider the two triangles $\triangle ADO'$ and $\triangle ACO$.



We have,

$\angle A$ is a common angle for both the triangles.

$\angle ADO = 90^\circ$ (Given in the problem)

$\angle ACO = 90^\circ$ (Since OC is the radius and AC is the tangent to that circle at C and we know that the radius is always perpendicular to the tangent at the point of contact)

Therefore,

$$\angle ADO = \angle ACO$$

From AA similarity postulate we can say that,

$$\triangle ACO \sim \triangle ADO'$$

Since the triangles are similar, all sides of one triangle will be in same proportion to the corresponding sides of the other triangle.

Consider AO' of $\triangle ADO'$ and AO of $\triangle ACO$.

$$\frac{AO'}{AO} = \frac{AO'}{AO' + O'X + OX}$$

Since AO' and $O'X$ are the radii of the same circle, we have,

$$AO' = O'X$$

Also, since the two circles are equal, the radii of the two circles will be equal. Therefore,

$$AO' = XO$$

Therefore we have

$$\frac{AO'}{AO} = \frac{AO'}{AO' + AO' + O'A}$$

$$\frac{AO'}{AO} = \frac{1}{3}$$

Since $\triangle ACO \sim \triangle ADO'$,

$$\frac{AO'}{AO} = \frac{DO'}{CO}$$

We have found that,

$$\frac{AO'}{AO} = \frac{1}{3}$$

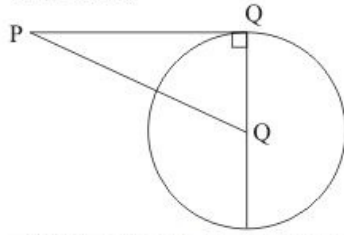
Therefore,

$$\frac{DO'}{CO} = \frac{1}{3}$$

Circles Ex 10.2 Q30

Answer :

In the figure,



$\angle PQO = 90^\circ$. Therefore we can use Pythagoras theorem to find the side PO .

$$PO^2 = PQ^2 + OQ^2 \dots\dots (1)$$

In the problem it is given that,

$$\frac{OQ}{PQ} = \frac{3}{4}$$

$$OQ = \frac{3}{4} PQ \dots\dots (2)$$

Substituting this in equation (1), we have,

$$PO^2 = \frac{9PQ^2}{16} + PQ^2$$

$$PO^2 = \frac{25PQ^2}{16}$$

$$PO = \sqrt{\frac{25PQ^2}{16}}$$

$$PO = \frac{5}{4} PQ \dots\dots (3)$$

It is given that the perimeter of ΔPOQ is 60 cm. Therefore,

$$PQ + OQ + PO = 60$$

Substituting (2) and (3) in the above equation, we have,

$$PQ + \frac{3}{4} PQ + \frac{5}{4} PQ = 60$$

$$\frac{12}{4} PQ = 60$$

$$3PQ = 60$$

$$PQ = 20$$

Substituting for PQ in equation (2), we have,

$$PO = \frac{5}{4} \times 20$$

$$OQ = \frac{3}{4} \times 20$$

$$OQ = 15$$

OQ is the radius of the circle and QR is the diameter. Therefore,

$$QR = 2OQ$$

$$QR = 30$$

Substituting for PQ in equation (3), we have,

$$PO = \frac{5}{4} \times 20$$

$$PO = 25$$

Thus we have found that $PQ = 20$ cm, $QR = 30$ cm and $PO = 25$ cm.

***** END *****