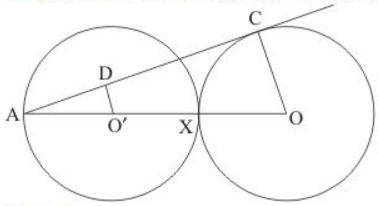
Circles Ex 10.2 Q29

Answer :

Consider the two triangles $\Delta ADO'$ and ΔACO.



We have,

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

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

$\angle ACO = 90°$ (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,

$\Delta ACO \sim \Delta ADO'$

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 $\Delta ADO'$ and AO of ΔACO.

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

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 $\Delta ACO \sim \Delta ADO'$,

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

We have found that,

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

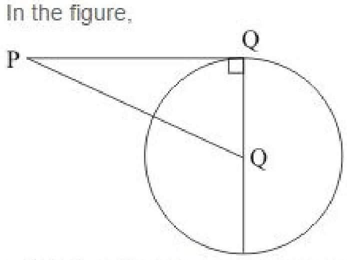
Therefore,

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

Circles Ex 10.2 Q30

Answer :

In the figure,



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

$PO^2 = PQ^2 + OQ^2$ ...... (1)

In the problem it is given that,

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

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

Substituting this in equation (1), we have,

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

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

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

$PO = \frac{5}{4}PQ$ ...... (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,

$$PO = \frac{5}{4} \times 15$$

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

$$OQ = 15$$

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

QR = 2*OQ*

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 **********