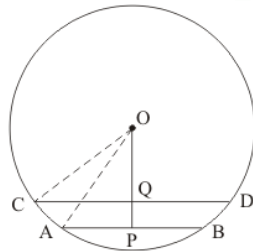




Circles Ex 16.2 Q4

Answer :

Let AB and CD be two parallel chord of the circle with centre O such that $AB = 5$ cm and $CD = 11$ cm.
let the radius of the circle be r cm.



Draw $OP \perp AB$ and $OQ \perp CD$ as well as point O , Q and P are collinear.

Clearly, $PQ = 3$ cm

Let $OQ = x$ then $OP = x + 3$

In $\triangle OAP$ and $\triangle OCQ$ we have

$$OA^2 = OP^2 + AP^2$$

$$\Rightarrow r^2 = (x+3)^2 + \left(\frac{5}{2}\right)^2 \dots\dots (1)$$

And

$$\begin{aligned} OC^2 &= OQ^2 + CQ^2 \\ \Rightarrow r^2 &= x^2 + \left(\frac{11}{2}\right)^2 \dots\dots (2) \end{aligned}$$

From (1) and (2) we get

$$\begin{aligned} (x+3)^2 + \left(\frac{5}{2}\right)^2 &= x^2 + \left(\frac{11}{2}\right)^2 \\ \Rightarrow x^2 + 6x + 9 + \frac{25}{4} &= x^2 + \frac{121}{4} \\ \Rightarrow 6x + \frac{61}{4} &= \frac{121}{4} \\ \Rightarrow 6x &= \frac{121-61}{4} \\ \Rightarrow 6x &= \frac{60}{4} \\ \Rightarrow x &= \frac{5}{2} \end{aligned}$$

Putting the value of x in (2) we get,

$$\begin{aligned} r^2 &= \left(\frac{5}{2}\right)^2 + \left(\frac{11}{2}\right)^2 \\ &= \frac{25}{4} + \frac{121}{4} \\ &= \frac{146}{4} \\ \Rightarrow r &= \sqrt{\frac{146}{4}} \\ r &= \boxed{\frac{\sqrt{146}}{2} \text{ cm}} \end{aligned}$$

*****END*****