

## 9.10.6.2

**Question :** Two chords  $AB$  and  $CD$  of lengths  $5cm$  and  $11cm$  respectively of a circle are parallel to each other and are on opposite sides of its centre.If the distance between  $AB$  and  $CD$  is  $6cm$ ,find the radius of the circle.

**Solution :**

Input parameters	Description	Value
<b>O</b>	Center	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$
$\theta_1$	$\angle MOA$	$\theta_1^\circ$
$\theta_2$	$\angle MOC$	$-170^\circ$

Table 1: Table of input parameters

Output parameters	Description	Value
<b>A</b>	Point	$r \begin{pmatrix} \cos \theta_1 \\ \sin \theta_1 \end{pmatrix}$
<b>B</b>	Point	$r \begin{pmatrix} -\cos \theta_1 \\ \sin \theta_1 \end{pmatrix}$
<b>C</b>	Point	$r \begin{pmatrix} \cos \theta_2 \\ \sin \theta_2 \end{pmatrix}$
<b>D</b>	Point	$r \begin{pmatrix} -\cos \theta_2 \\ \sin \theta_2 \end{pmatrix}$

Table 2: Table of output parameters

For getting  $\theta_1$ ,

$$AB = 5 \quad (1)$$

$$2r \cos \theta_1 = 5 \quad (2)$$

$$CD = 11 \quad (3)$$

$$2r \cos \theta_2 = 11 \quad (4)$$

$$\text{or, } \frac{\cos \theta_1}{\cos \theta_2} = \frac{5}{11} \quad (5)$$

$$\text{or, } \theta_1 = 117^\circ \quad (6)$$

Two chords are parallel and opposite to each other. So,

$$OA^2 = OC^2 \quad (7)$$

$$OQ^2 + CQ^2 = OP^2 + PA^2 \quad (8)$$

$$(OP - OQ) 6 = \left(\frac{11}{2}\right)^2 - \left(\frac{5}{2}\right)^2 \quad (9)$$

$$\text{or, } OP - OQ = 4 \quad (10)$$

$$\text{or, } OP = 5 \quad (11)$$

$$\text{So, } r = OA = OC = 5.59 \text{ cm} \quad (12)$$

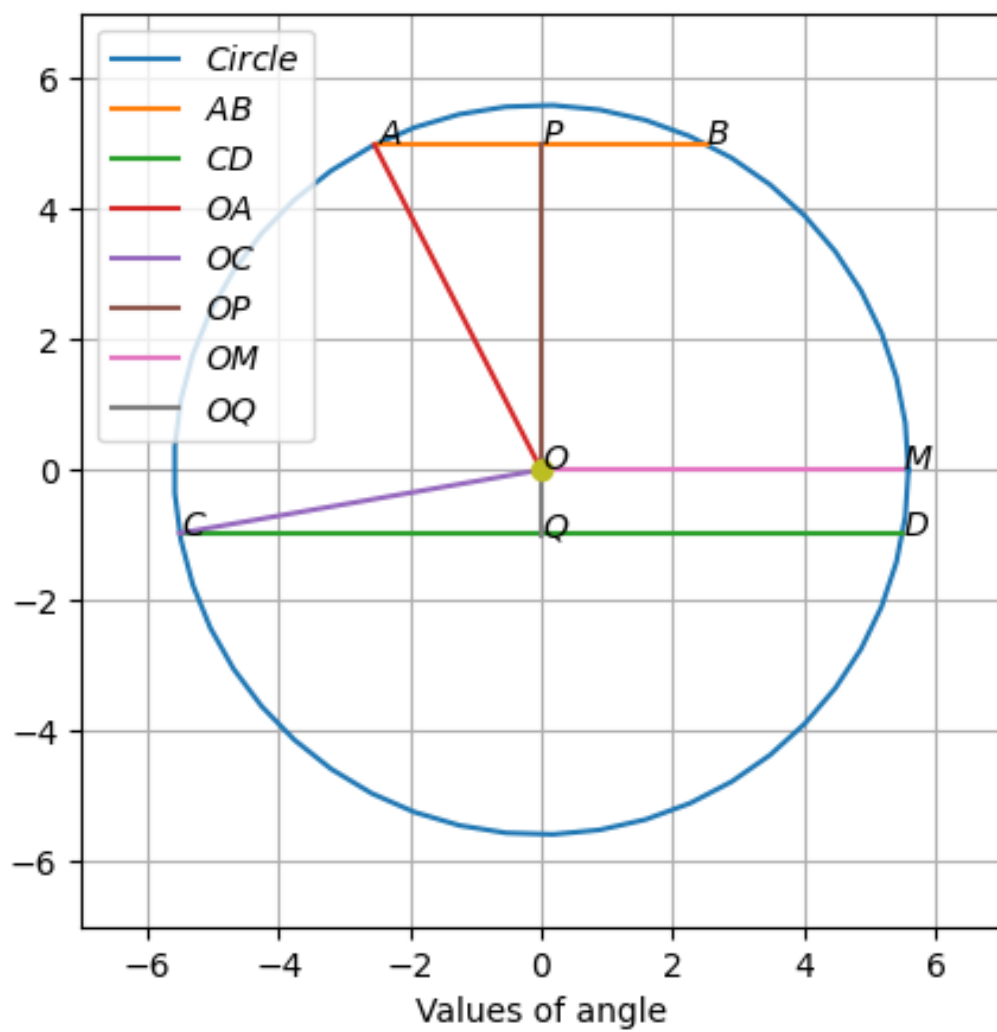


Figure 1: