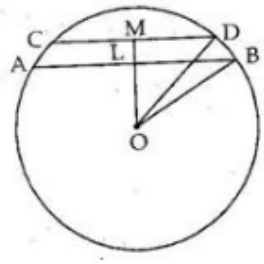
Exercise 11A

Question 4:

(i) Let AB and CD be two chords of a circle such that AB ∥ CD which are on the same side of the circle. Also AB = 8 cm and CD = 6 cm. OB = OD = 5 cm. Join OL and LM.

Since the perpendicular from the centre of a circle to a chord bisects the chord.



We have $LB = \frac{1}{2} \times AB$

$= \left(\frac{1}{2} \times 8\right)$ cm $= 4$ cm

and $MD = \frac{1}{2} \times CD$

$= \left(\frac{1}{2} \times 6\right)$ cm $= 3$ cm

Now in right angled Δ BLO

$OB^2 = LB^2 + LO^2$

$\Rightarrow \quad LO^2 = OB^2 - LB^2$

$\Rightarrow \quad = 5^2 - 4^2$

$= 25 - 16 = 9$

$\therefore \quad LO = \sqrt{9} = 3$ cm.

Again in right angled ΔDMO

$OD^2 = MD^2 + MO^2$

$\Rightarrow \quad MO^2 = OD^2 - MD^2$

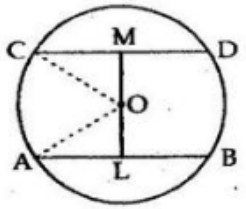
$= 5^2 - 3^2$

$= 25 - 9 = 16$

$\Rightarrow \quad MO = \sqrt{16} = 4$ cm

$\therefore$ The distance between the chords $= (4 - 3)$ cm $= 1$ cm.

(ii)Let AB and CD be two chords of a circle such that AB || CD and they are on the opposite sides of the centre. AB = 8 cm and CD = 6 cm. Draw OL ⊥ AB and OM ⊥ CD.



Join OA and OC

Then OA = OC = 5cm(radius)

Since the perpendicular from the centre of a circle to a chord bisects the chord, we have,

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

$$= \left(\frac{1}{2}\times 8\right) \text{ cm} = 4 \text{ cm}$$

Also $$CM = \frac{1}{2}CD$$

$$= \left(\frac{1}{2}\times 6\right)\text{cm} = 3 \text{ cm}$$

Now in right angled Δ OLA, we have

$$OA^2 = AL^2 + OL^2$$

$$\Rightarrow \quad OL^2 = OA^2 - AL^2$$

$$= 5^2 - 4^2$$

$$= 25 - 16 = 9 \text{ cm}$$

$$\therefore \quad OL = \sqrt{9} = 3 \text{ cm}$$

Again in right angled Δ OMC, we have

$$OC^2 = OM^2 + CM^2$$

$$\Rightarrow \quad OM^2 = OC^2 - CM^2$$

$$= 5^2 - 3^2$$

$$= 25 - 9 = 16$$

$$\Rightarrow \quad OM = \sqrt{16} = 4 \text{cm}$$

$\therefore$ the distance between the chords = (4 + 3)cm = 7 cm

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