10 | CIRCLES

EXERCISE 10.2

Q.1. *Recall that two circles are congruent if they have the same radii. Prove that equal chords of congruent circles subtend equal angles at their centres.*

Sol. Given : Two congruent circles with centres O and O′. AB and CD are equal chords of the circles with centres O and O′ respectively.
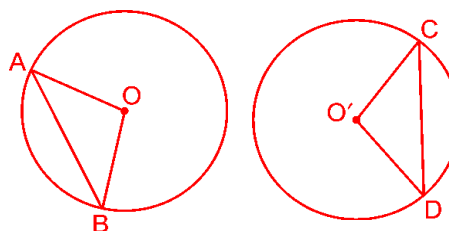
To Prove : ∠AOB = ∠COD

Proof : In triangles AOB and COD,

AB = CD   [Given]

$\left.\begin{array}{l} \text{AO = CO′} \\ \text{BO = DO′} \end{array}\right\}$ [Radii of congruent circle]

⇒ ΔAOB ≅ ΔCO′D   [SSS axiom]

⇒ ∠AOB ≅ ∠CO′D   **Proved.** [CPCT]

Q.2. *Prove that if chords of congruent circles subtend equal angles at their centres, then the chords are equal.*

Ans. Given : Two congruent circles with centres O and O′. AB and CD are chords of circles with centre O and O′ respectively such that ∠AOB = ∠CO′D

To Prove : AB = CD

Proof : In triangles AOB and CO′D,

$\left.\begin{array}{l} \text{AO = CO′} \\ \text{BO = DO′} \end{array}\right\}$ [Radii of congruent circle]

∠AOB = ∠CO′D   [Given]

⇒ ΔAOB ≅ ΔCO′D   [SAS axiom]

⇒   AB = CD   **Proved.** [CPCT]