



SpeedLabs

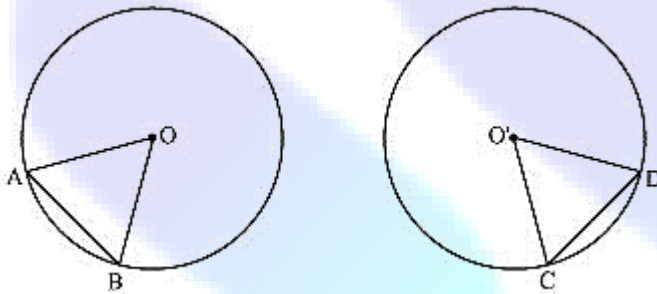
MATHS

CBSE 9th

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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 centers.

Ans. A circle is a collection of points which are equidistant from a fixed point. This fixed point is called as the Centre of the circle and this equal distance is called as radius of the circle. And thus, the shape of a circle depends on its radius. Therefore, it can be observed that if we try to superimpose two circles of equal radius, then both circles will cover each other. Therefore, two circles are congruent if they have equal radius. Consider two congruent circles having Centre O and O' and two chords AB and CD of equal lengths.



In $\triangle AOB$ and $\triangle CO'D$,

$AB = CD$ (Chords of same length)

$OA = O'C$ (Radii of congruent circles)

$OB = O'D$ (Radii of congruent circles)

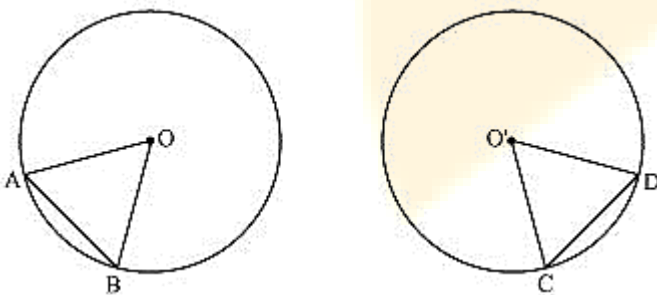
$\therefore \triangle AOB \cong \triangle CO'D$ (SSS congruence rule)

$\Rightarrow \angle AOB = \angle CO'D$ (By CPCT)

Hence, equal chords of congruent circles subtend equal angles at their centers.

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

Ans. Let us consider two congruent circles (circles of same radius) with centers as O and O' .



In $\triangle AOB$ and $\triangle CO'D$,

$\angle AOB = \angle CO'D$ (Given)

$OA = O'C$ (Radii of congruent circles)

$OB = O'D$ (Radii of congruent circles)

$\therefore \triangle AOB \cong \triangle CO'D$ (SAS congruence rule)

$\Rightarrow AB = CD$ (By CPCT)

Hence, if chords of congruent circles subtend equal angles at their centers, then the chords are equal.