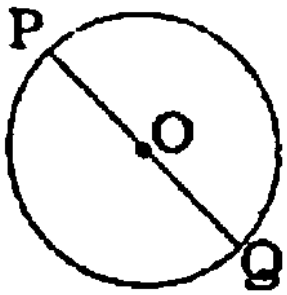
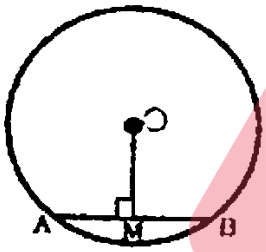
PROPERTIES OF CIRCLE

1. A chord which passes through the centre is called the diameter of the circle. It is a largest chord of the circle.

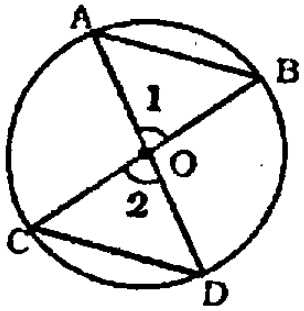


2. The perpendicular from the centre of a circle to a chord bisects the chord.
i.e. If OM ⊥ AB, then AM = BM



Converse of the above theorem: - The line joining the centre of a circle to the midpoint of a chord is perpendicular to the chord.
i.e. AM = MB, then OM ⊥ AB.

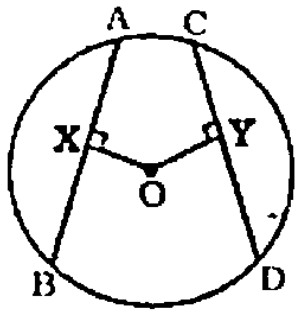
3. Equal chords of a circle subtend equal angles at the centre.
i.e. If AB = CD, then ∠1 = ∠2.



Converse of the above theorem: - Angles subtended by two chords at the centre of a circle are equal then the chords are equal.
i.e. If ∠1 = ∠2, then AB = CD.

4. Equal chords of a circle are equidistance from the centre.

i.e. If AB = CD, OX ⊥ AB and OY⊥ CD, then OX = OY.



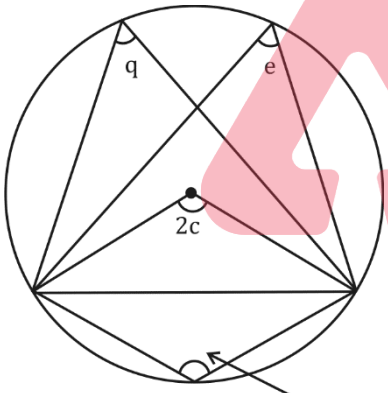
Converse of the above theorem: chords equidistant from the centre of the circle area equal.

i.e. If OX ⊥ AB, OY ⊥CD and OX = OY then AB = CD.

5. Degree Measure Theorem:

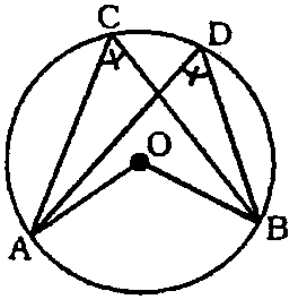
The angle subtended by a chord at the centre of a circle is twice the angle subtended by the chord at any point on the major arc.

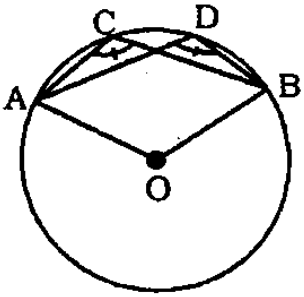
i.e. ∠x at the centre and ∠ y at the circumference made by the same arc AB, then $\boxed{\angle x = 2\angle y}$



In a minor Arc it is 180 - q

6. Angles in the same segment of a circle are equal.

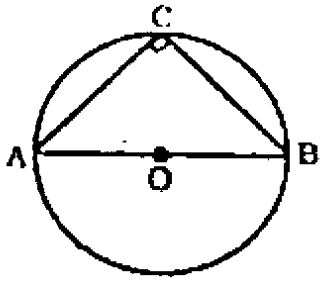




i.e. ∠ACB = ∠ADB

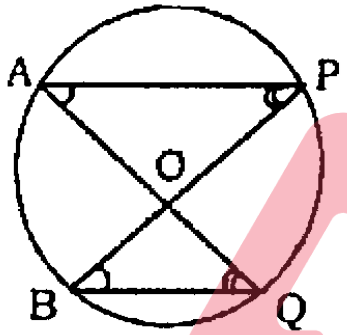
(angles in same arc) or (angles in same segment)

7. The angles in a semi circle is a right angle.
i.e.∠ ACB = 90°.



Converse of the above theorem: The circle, drawn with hypotenuse of a right triangle as diameter, passes through its opposite vertex.

8. If ∠ APB = ∠ AQB, and If P, Q are on the same side of AB, then A, B, Q, O & P are concylic i.e. lie on the same circle.



9. The sum of the either pair of the opposite angles of a cyclic quadrilateral is 180°.
i.e. ∠ A + ∠ C = ∠ B + ∠ D = 180°