CLASS NOTES	
Class: IX	**Ch.10. CIRCLES**
Subject: Mathematics	**Topic: Introduction**

CHAPTER –10

CIRCLES

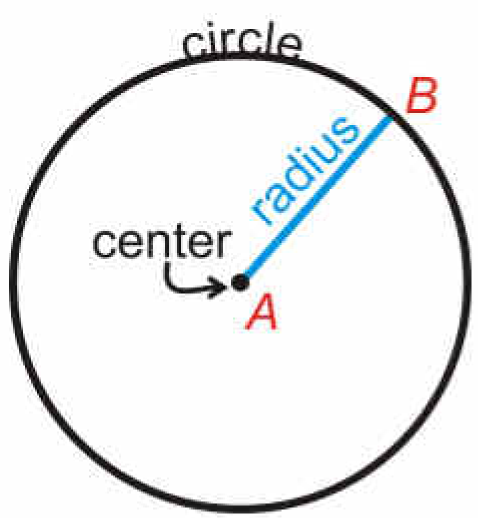
Points to remember: -

Introduction to Circles

There are lot many objects in our life which are round in shape. Few examples are the clock, dart board, cartwheel, ring, Vehicle wheel, Coins, etc.

Circles

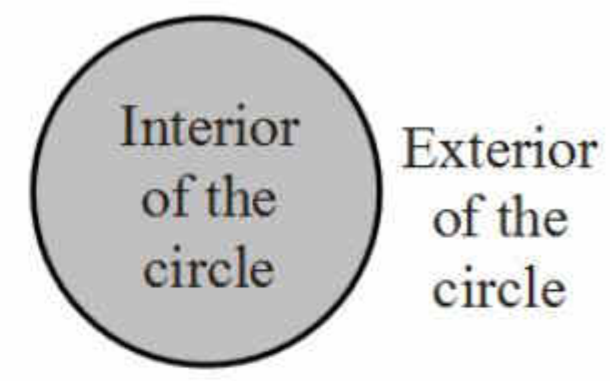
- Any closed shape with all points connected at equidistance from centre forms a **Circle**.
- Any point which is at equidistance from anywhere from its boundary is known as the **Centre of the Circle**.
- Radius is a Latin word which means 'ray' but in the circle it is the line segment from the centre of the Circle to its edge. So any line starting or ending at the centre of the circle and joining anywhere on the border on the circle is known as the **Radius of Circle**.



Interior and Exterior of a Circle

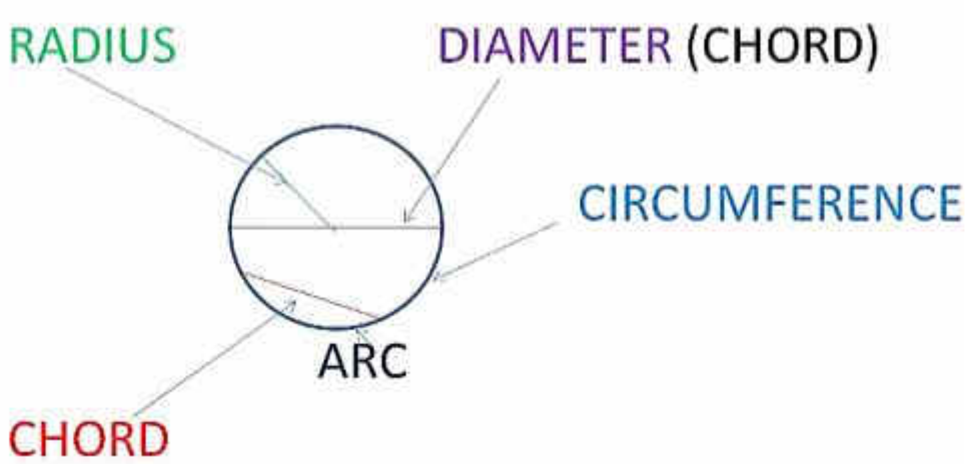
In a flat surface, the **interior of a circle** is the line whose distance from the centre is less than

the radius.
The **exterior of a circle** is the line in the plane whose distance from the centre is larger than the radius.



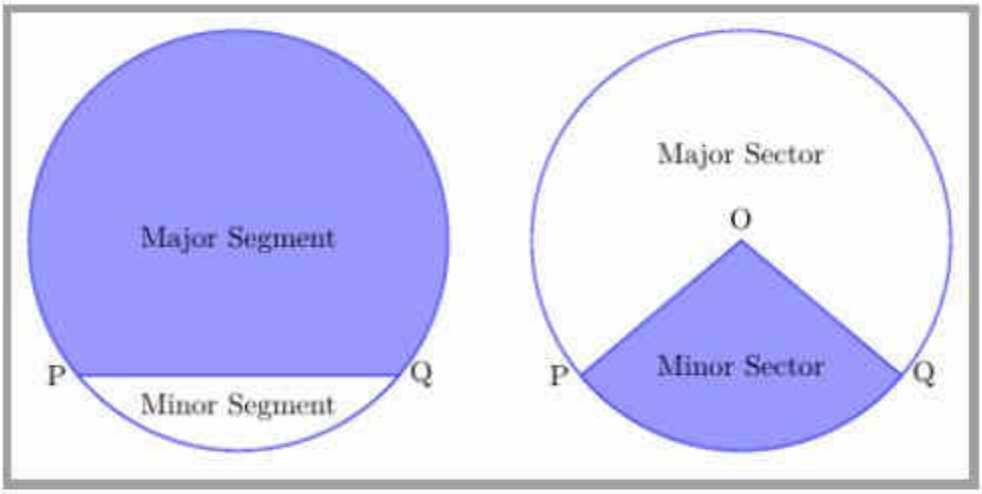
Terms related to circle

- **Chord:** Any straight line segment whose both endpoints falls on the boundary of the circle is known as Chord.
- **Diameter:** Any straight line segment or Chord which passes through the centre of the Circle and its endpoints connects on the boundary of the Circle is known as the **Diameter of Circle**. So in a circle Diameter is the longest chord possible in a circle.
- **Arc:** Any smooth curve joining two points is known as **Arc**. So in Circle, we can have two possible Arcs, the bigger one is known as **Major Arc** and the smaller one is known as **Minor Arc**.
- **Circumference:** It is the length of the circle if we open and straightened out to make a line segment



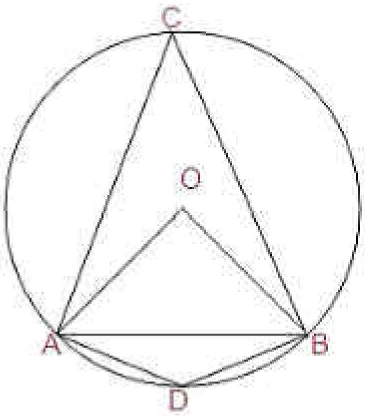
Segment and Sector of the Circle

A segment of the circle is the region between either of its arcs and a chord. It could be a major or minor segment.
Sector of the circle is the area covered by an arc and two radii joining the centre of the circle. It could be the major or minor sector.



Angle Subtended by a Chord at a Point

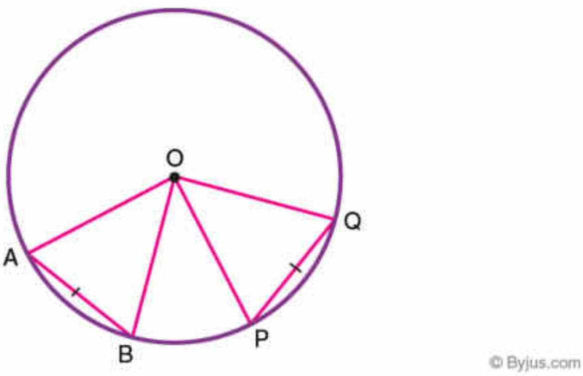
If in a circle AB is the chord and is making ∠ACB at any point of the circle then this is the angle subtended by the chord AB at a point C.



Likewise, ∠AOB is the angle subtended by chord AB at point O i.e. at the centre and ∠ADB is also the angle subtended by AB at point D on the circle.

Theorem 1:

“Two equal chords of a circle subtend equal angles at the centre of the circle.



Proof: Given, in ΔAOB and ΔPOQ,

AB = PQ (Equal Chords) …………..(1)

OA = OB= OP=OQ (Radii of the circle) ……..(2)

From eq 1 and 2, we get;

ΔAOB ≅ ΔPOQ (SSS Axiom of congruency)

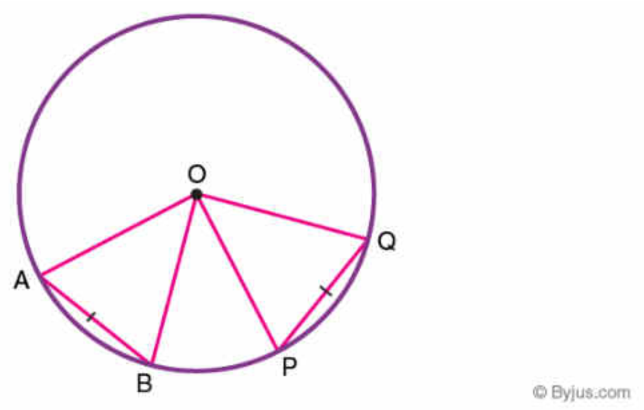
Therefore, by CPCT (corresponding parts of congruent triangles), we get;

∠AOB = ∠POQ

Hence, Proved.

Converse of Theorem 1:

"If two angles subtended at the center by two chords are equal, then the chords are of equal length."



Proof: Given, in ΔAOB and ΔPOQ,

∠AOB = ∠POQ (Equal angle subtended at centre O) ……………(1)

OA = OB = OP = OQ (Radii of the same circle) ……………(2)

From eq. 1 and 2, we get;

ΔAOB ≅ ΔPOQ (SAS Axiom of congruency)

Hence,

AB = PQ (By CPCT)

Assignment :-Exe- 10.1 and Exe-10.2

The above content is prepared entirely at home