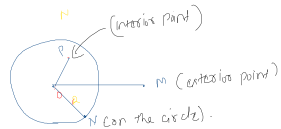
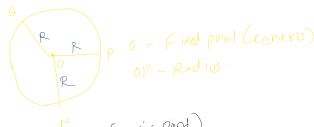


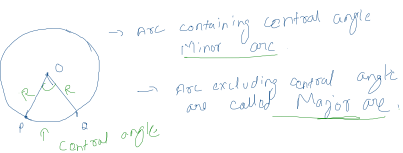
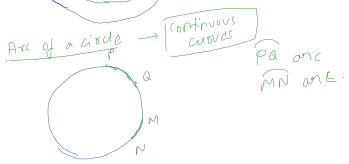
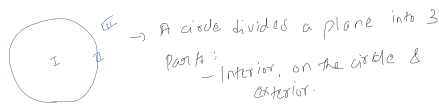
ch-10 Circles

The collection of all the points in a plane, which are at a fixed distance from a fixed point in the plane, is called a circle.

O - Fixed point
OP, OR, ... - Constant distance

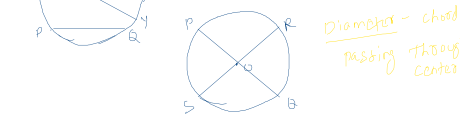
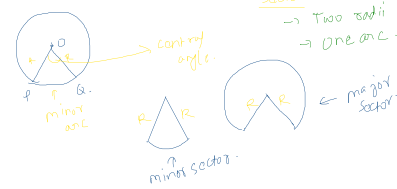


OM > R
ON = R
OP < R.

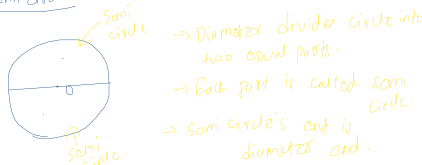


Sector

Two radii
One arc.



Semi Circle



Segment



- EXERCISE 10.1
- Fill in the blanks:
 - The centre of a circle lies in the interior of the circle. (interior or exterior)
 - A point whose distance from the centre of a circle is greater than its radius lies in exterior of the circle. (interior or exterior)
 - The longest chord of a circle is a diameter of the circle.
 - An arc is a part of the circle between two points on the circle.
 - Segment of a circle is the region between an arc and chord of the circle.
 - A circle divides the plane into two parts, i.e. interior and exterior.

- Write True or False. Give reasons for your answers.
- Line segment joining the centre to any point on the circle is a radius of the circle. ✓
 - A circle has only one fixed point. ✗
 - A circle is a set of all points equidistant to a fixed point. ✓
 - The longest chord of a circle is a diameter of the circle. ✓
 - An arc is a part of the circle between two points on the circle. ✓
 - Segment of a circle is the region between an arc and a chord of the circle. ✓
 - A circle divides the plane into two parts, i.e. interior and exterior. ✓

EXERCISE 10.2

1. Prove that two circles are congruent if they have the same radii. (Prove that equal radii of congruent circles subtend equal angles at their centres.)



To prove: $\angle A = \angle P$

Proof: In $\triangle ABC$ and $\triangle PQR$
 $AB = PQ$ (Given)
 $AC = PR$ (Given)
 $BC = QR$ (Given)
 $\triangle ABC \cong \triangle PQR$ (SSS rule)
 $\angle BAC = \angle RPQ$ (C.P.C.T.)
 $\angle A = \angle P$

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

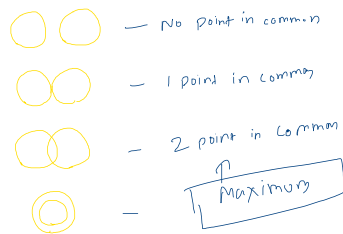


To prove: $BC = OR$
 $\angle A = \angle P$

Proof: In $\triangle ABC$ and $\triangle PQR$
 $AB = PQ$
 $AC = PR$ (Radii of congruent circles)
 $\angle BAC = \angle RPQ$ (Given)
 $\triangle ABC \cong \triangle PQR$ (SAS rule)
 $BC = QR$ (C.P.C.T.)

EXERCISE 10.3

1. Draw different pairs of circles. How many points does each pair have in common? What is the maximum number of common points?



2. Suppose you are given a circle. Give a construction to find its centre.

