## **Chapter-12**

Area Related to Circles

- **Circle:** A circle is the locus of a point which moves in a plane in such a way that its distance from a fixed point always remains the same. The fixed point is called the center and given constant distance is known as the radius of the circle.

- **Segment of a Circle:** The portion (or part) of a circular region enclosed between a chord and the corresponding arc is called a segment of the circle. In adjacent fig. APB is minor segment and AQB is major segment.
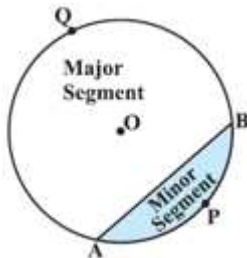
- **Sector of a Circle:** The portion (or part) of the circular region enclosed by the two radii and the corresponding arc is called a sector of the circle. In adjacent figure OAPB is minor sector and OAQB is the major sector.

- Area of circle = πr^2 where 'r' is the radius of the circle.

- Area of Semi circle = $\dfrac{\pi r^2}{2}$

- Area enclosed by two concentric circles
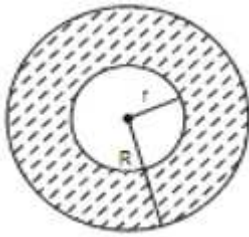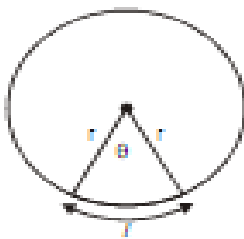
$$= \pi(R^2 - r^2)$$
$$= \pi(R + r)(R - r); R > r$$

where 'R' and 'r' are radii of two concentric circles.

- The arc length 'l' of a sector of angle $'\theta'$ in a circle of radius 'r' is given by

$$l = \frac{\theta}{360^\circ} \times 2\pi r$$

$$l = \frac{\theta}{180^\circ} \times 2\pi r$$

- If the arc subtends an angle θ, then area of the corresponding sector is $\dfrac{\theta}{360^\circ} \times \pi r^2$

- Angle described by minute hand in 60 minutes = 360°. Angle described by minute hand in 1 minute $= \left(\dfrac{360^\circ}{60} \right) = 6^\circ$