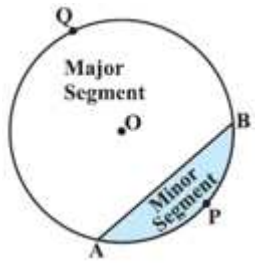
Chapter-12

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.



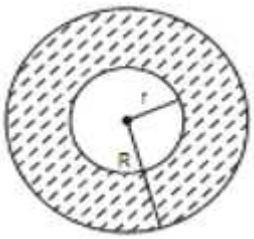
- **Sector of a Circle:** The portion (or part) of the circular region enclosed by the two radii and the corresponding arc is called a sector of the circle. In adjacent figure OAPB is minor sector and OAQB is the major sector.

- Area of circle = πr^2 where 'r' is the radius of the circle.
- Area of Semi circle = $\frac{\pi^2}{2}$
- Area enclosed by two concentric circles

$= \pi(R^2 - r^2)$

$= \pi(R + r)(R - r); R > r$

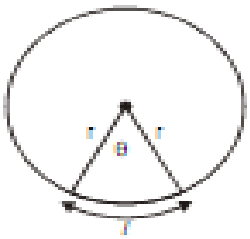
where ‘R’ and ‘r’ are radii of two concentric circles.



- The arc length ‘l’ of a sector of angle θ' in a circle of radius ‘r’ is given by

$$l = \frac{\upsilon}{360^{o}} \times . \pi$$

$$l = \frac{\upsilon}{180^{o}} \times . \pi$$



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

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