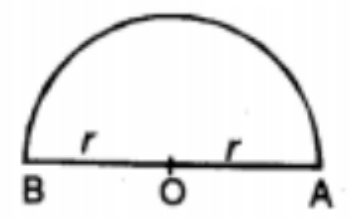
Areas Related to Circles Formulas CBSE Class 10 Maths

Circumference of a Circle or Perimeter of a Circle

- The distance around the circle or the length of a circle is called its circumference or perimeter.
- Circumference (perimeter) of a circle = πd or 2πr,
  where d is a diameter and r is a radius of the circle and π = $\frac{22}{7}$
- Area of a circle = πr^2
- Area of a semicircle = $\frac{1}{2}\pi r^2$
- Area of quadrant = $\frac{1}{4}\pi r^2$

Perimeter of a semicircle:

Perimeter of a semicircle or protractor = πr + 2r



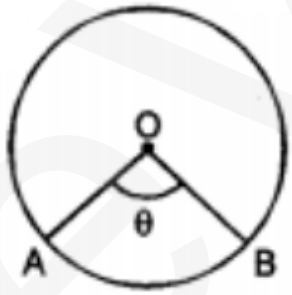
Area of the ring Formulas :

Area of the ring or an annulus = $\pi R^2 - \pi r^2$

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

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

Length of the arc AB = $\frac{2\pi r\theta}{360^0} = \frac{\pi r\theta}{180^0}$



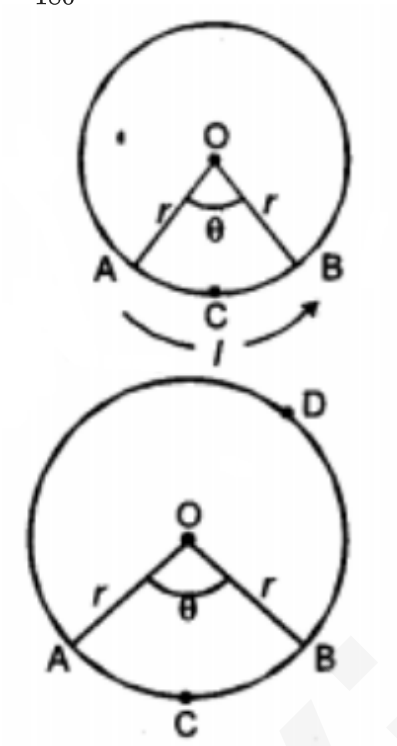
Area of sector formula:

- Area of sector OACBO = $\frac{\pi r^2 \theta}{360^0}$
- Area of sector OACBO = $\frac{1}{2}$ (r × l).

Perimeter of a sector Formula:

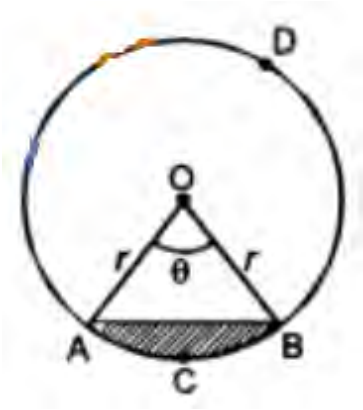
Perimeter of sector OACBO = Length of arc AB + 2r

= $\frac{\pi r \theta}{180^0}$ + 2r



- Distance moved by a wheel in 1 revolution = Circumference of the wheel.
- Number of revolutions in one minute = $\frac{Distance moved in 1 minute}{Circumference}$
- Angle described by minute hand in 60 minutes = 360°
- Angle described by hour hand in 12 hours = 360°
- The mid-point of the hypotenuse of a right triangle is equidistant from the vertices of the triangle.
- The angle subtended at the circumference by a diameter is always a right angle.

Area of a segment Formula Class 10 :



- Area of minor segment ACBA = Area of sector OACBO – Area of ΔOAB
  = $\frac{\pi r^2 \theta}{360^0} - \frac{1}{2} r^2 sin\theta$
- Area of major segment BDAB = Area of the circle – Area of minor segment ACBA
  = πr^2 – Area of minor segment ACBA.
- If a chord subtends a right angle at the centre, then
  Area of the corresponding segment = $\left(\frac{\pi}{4} - \frac{1}{2}\right) r^2$
- If a chord subtends an angle of 60° at the centre, then
  Area of the corresponding segment = $\left(\frac{\pi}{3} - \frac{\sqrt{3}}{2}\right) r^2$
- If a chord subtends an angle of 120° at the centre, then
  Area of the corresponding segment = $\left(\frac{\pi}{3} - \frac{\sqrt{3}}{4}\right) r^2$