

CIRCLE



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A circle is a closed curved shape where all points are equidistant from a fixed central point called the center. The constant distance from the center to any point on the circle is called the radius.

Properties of Circle

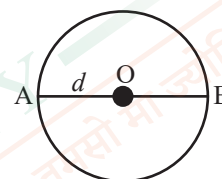
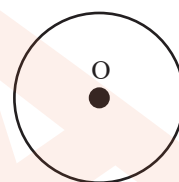
Center (O)

- The fixed point inside the circle.
- All points on the circle are equidistant from the center.

Example: In a clock, the center is where the hands meet

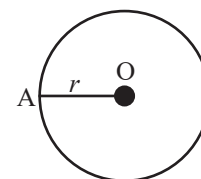
Diameter (d)

- Longest chord passing through the center
- Equal to twice the radius
- **Formula:** $d = 2r$
- Diameter is the longest chord
- Diameter bisects the circle into two equal semicircles



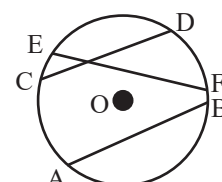
Radius (r)

- Distance from center to any point on the circle
- All radii of a circle are equal in length
- **Formula:** $r = \frac{d}{2}$ (where d is diameter)



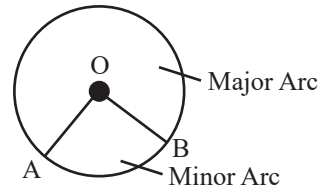
Chord

- A line segment joining any two points on the circle
- Diameter is the longest chord
- Equal chords are equidistant from the center
- The perpendicular from the center to a chord bisects the chord
- Chords equidistant from center are equal in length



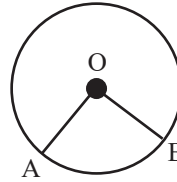
Arc

- A portion of the circumference between two points
- **Minor Arc:** Smaller portion (less than semicircle)
- **Major Arc:** Larger portion (more than semicircle)



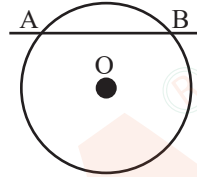
Sector

- Region bounded by two radii and an arc
- Like a slice of pie



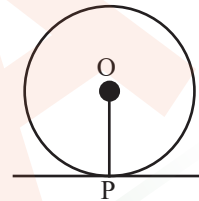
Secant

- A line that intersects the circle at two points.



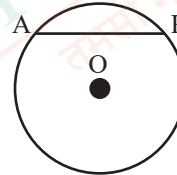
Tangent

- A line that touches the circle at exactly one point.
- Perpendicular to the radius at the point of contact.
- Tangent is perpendicular to radius at point of contact
- Two tangents from an external point are equal in length
- Angle between tangent and chord equals half the arc subtended by the chord



Segment

- Region bounded by a chord and the arc it cuts off



Circumference (C)

- **Formula:** $C = 2\pi r = \pi d$

Area (A)

- **Formula:** $A = \pi r^2$

Sector Area

- **Formula:** $\text{Area} = \frac{\theta}{360^\circ} \times \pi r^2$ (where θ is in degrees)

Sector Arc Length

- **Formula:** $\text{Arc length} = \frac{\theta}{360^\circ} \times \pi r$