

CLASS 10 MATHS – CHAPTER 10

CIRCLES – ALL FORMULAE

Basic Idea

- Circle → all points equidistant from centre
- Fixed point = centre (O)
- Constant distance = radius (r)
- Symmetrical shape
- Used in daily life (wheels, clocks)
- Important geometry concept
- Closed plane figure
- Base for tangent theorems

Important Terms

- Radius → centre to circle
- Diameter → $2 \times$ radius
- Chord → joins two points
- Arc → part of circle
- Segment → region of chord & arc
- Diameter is longest chord
- All radii equal

Line & Circle

- No intersection → outside line
- One point → tangent
- Two points → secant
- Tangent touches once
- Secant cuts circle
- Depends on position

Tangents

- Touches circle at one point
- Point = point of contact
- Only one tangent at a point
- From external point → two tangents
- From inside → no tangent
- From circle → one tangent

Tangent Theorems

- Tangent \perp radius at contact
- Forms 90° angle
- Two tangents from external point equal
- $PA = PB$
- Based on congruence

Properties

- Equal chords \rightarrow equal angles
- Perpendicular bisects chord
- Equal chords equidistant
- Equal arcs \rightarrow equal angles
- Angle at centre = $2 \times$ angle

Cyclic Quadrilateral

- All vertices on circle
- Opposite angles = 180°
- Converse also true
- Used in proofs
- Helps identify shapes