



TANGENTS TO A CIRCLE

Chapter: Circles

Topic: Tangents to a Circle



1. CHAPTER SNAPSHOT



Definition: A tangent is a line that touches a circle at exactly one point, called the point of contact.



Big Idea: Understand the relationship between a tangent and the radius of a circle, and apply the tangent theorem to solve geometry problems.



Real-Life Connection: Tangents are seen in rolling wheels on roads, belts moving over pulleys, and circular tracks.



Why It Matters: This concept is used to solve proofs, find unknown lengths and angles, and apply the Pythagoras Theorem.



Key Vocabulary: Circle, Centre, Radius, Chord, Secant, Tangent, Point of Contact, Normal, Perpendicular.



2. HIGH-YIELD CONCEPTS

- **Tangent:** Touches the circle at exactly one point.
- **Point of Contact:** The point where the tangent touches the circle.
- **Key Theorem:** The radius through the point of contact is perpendicular to the tangent.
- **One Point, One Tangent:** Only one tangent can be drawn at a point on a circle.
- **Secant vs Tangent:** A secant cuts the circle at two points; a tangent touches it at one point.
- **Chord:** A line segment joining any two points on the circle.
- **Problem-Solving Tip:** If a radius and tangent are given, mark the right angle (90°) and use the Pythagoras Theorem, if applicable.



3. THEOREM BOX

Theorem 1

Statement

The tangent at any point of a circle is perpendicular to the radius through the point of contact.

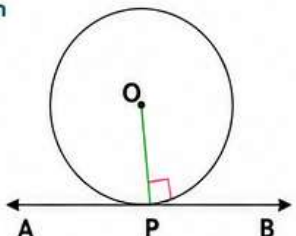
Mathematical Representation

$$OP \perp AB$$

or

$$\angle OPB = 90^\circ$$

where AB is the tangent at P and O is the centre of the circle.



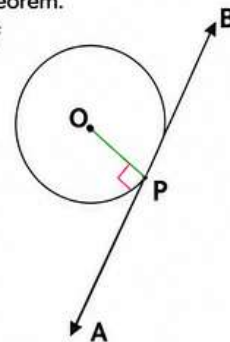
4. BOARD EXAM FOCUS (HOTSPOTS)

Frequently Asked Questions

- State and apply the tangent theorem.
- Prove that the radius is perpendicular to the tangent.
- Find unknown lengths using the Pythagoras Theorem.
- Identify the tangent, secant, chord, and point of contact from a figure.

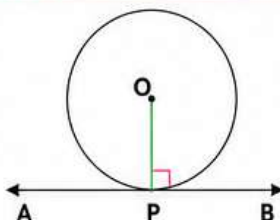
Quick Exam Tips

- ✓ First mark the 90° angle between the radius and the tangent.
- ✓ Look for a right triangle and apply the Pythagoras Theorem.
- ✓ In proof questions, always begin with the tangent theorem before proceeding.
- ✓ Read the figure carefully to identify the point of contact correctly.



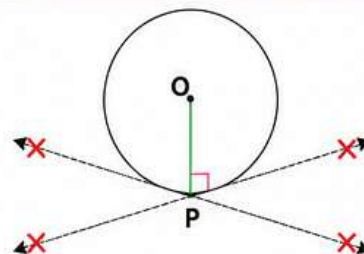
5. SMART REVISION TIPS

- ✓ Remember the keyword "Touches" → Tangent.
- ✓ One Point = Tangent, Two Points = Secant.
- ✓ Radius + Tangent always form a right angle.
- ✓ Sketch the figure whenever solving a geometry problem.



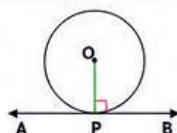
6. COMMON MISTAKES

- ✗ Confusing a secant with a tangent.
- ✗ Forgetting to mark the 90° angle.
- ✗ Applying the Pythagoras Theorem without identifying a right triangle.
- ✗ Assuming more than one tangent can be drawn at the same point.



7. MUST REMEMBER (RAPID SUMMARY)

- ✓ Tangent touches the circle at one point.
- ✓ Secant intersects the circle at two points.
- ✓ Chord joins two points on the circle.
- ✓ Radius $\perp$ Tangent at the point of contact.
- ✓ Use the Pythagoras Theorem when a right triangle is formed.



8. RAPID REVISION (30 SECONDS)

Tangent	→ One point
Secant	→ Two points
Chord	→ Joins two points
Point of Contact	→ Common point of tangent and circle
Theorem	→ Radius $\perp$ Tangent
Application	→ Right triangle → Pythagoras Theorem



9. KEY TAKEAWAY

Whenever a tangent touches a circle, the radius drawn to the point of contact is always perpendicular to the tangent. This single property forms the foundation for most theorem-based and application questions in the CBSE Class 10 Circles chapter.

