

Tangent to a Circle

Chapter 10: Circles · Topic 1

Key Concept

This perpendicularity property is fundamental to solving many circle-related problems — for example, if a tangent is drawn from an external point to a circle, the length of this tangent can be calculated using the Pythagoras theorem, since the radius, tangent, and the line from the external point to the centre form a right triangle. For a tangent length of unknown value, radius 5cm, and distance from external point to centre 13cm: $\text{tangent}^2 + 5^2 = 13^2$, giving tangent = 12cm.

Quick Revision Notes

- A tangent touches a circle at exactly one point, without entering its interior.
- A tangent is always perpendicular to the radius at the point of contact.
- This perpendicularity creates a right triangle, solvable using the Pythagoras theorem.
- Example: radius 5cm, external distance 13cm, gives tangent length 12cm.

Practice Questions

- 1 If a tangent is drawn to a circle of radius 5cm from an external point 13cm away, find the tangent length.
- 2 Find the tangent length for a circle of radius 6cm and external point distance 10cm.
- 3 Explain why the radius and tangent form a right angle at the point of contact.