Chords and tangents

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. A radius meets a tangent at its point of contact. Find the angle between them. [2 marks]

The tangent-radius theorem gives perpendicular lines.

Answer: 90°.

2. A radius-5 cm circle has a chord 3 cm from its centre. Find the chord length. [2 marks]

Half-chord $a = \sqrt{25 - 9} = 4$; double it.

Answer: 8 cm.

3. Two tangent lengths from P are $2x + 7$ and $4x - 5$. Find x and their common length. [3 marks]

Set $2x + 7 = 4x - 5$, so $x = 6$; substitute.

Answer: $x = 6$; 19 units.

4. A tangent and chord AB make a 52° angle. C is on the alternate segment. Find angle ACB. [2 marks]

Apply the alternate-segment theorem to chord AB.

Answer: 52°.

5. Two chords in the same circle are each 16 cm long. One is 6 cm from the centre. How far is the other from the centre? Explain. [2 marks]

Equal chords in one circle are equally distant from the centre.

Answer: 6 cm.

6. A tangent PT is 24 cm long and OP is 25 cm, where O is the circle centre. Find the radius OT. [3 marks]

OT is perpendicular to PT.

$OT^2 = 25^2 - 24^2 = 49$, so $OT = 7$ cm.

Answer: 7 cm.