Worked answers | Geometry and proof

Chords, radii and tangents

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. A radius 13 cm circle has chord length 10 cm. Find the perpendicular distance from centre to chord. [2 marks]

Half-chord 5 cm.

$\text{Distance} = \sqrt{169 - 25} = 12.$

Answer: 12 cm

2. A chord is 12 cm long and 3 cm from the centre. Find the radius. [2 marks]

$r = \sqrt{6^2 + 3^2} = \sqrt{45}$.

Answer: $3\sqrt{5}$ cm

3. A tangent from P has length 15 cm and the radius to its contact point is 8 cm. Find the centre-to-P distance. [2 marks]

$\sqrt{15^2 + 8^2} = 17.$

Answer: 17 cm

4. Tangents PA and PB from P have lengths $2x+1$ and $3x-4$. Find x and the common tangent length. [2 marks]

$2x+1=3x-4$ gives $x=5$.

$2\times5+1=11$.

Answer: $x=5$; length 11

5. A radius 10 cm circle has a chord 16 cm long. A student uses 10^2-16^2. Explain the error and give the correct distance. [3 marks]

The right-triangle leg is 8, not 16.

$\sqrt{100-64}=6$.

Answer: Use half the chord; distance 6 cm.

6. A line joins the circle centre to the midpoint of a non-diameter chord. What angle does it make with the chord? [2 marks]

The point must be the circle’s centre and the other point the chord midpoint.

Answer: 90°.