Intersecting-chord/secant/tangent length relationships

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. Chords meet at E with segment lengths 2 and 15 on one chord, and 5 and x on the other. Find x. [2 marks]

$2 \times 15 = 5x$, hence $x = 6$.

Answer: $x = 6$.

2. A tangent has length 10. A secant from the same point has outside length 4. Find its whole length. [2 marks]

$10^2 = 4L$, so $L = 25$.

Answer: 25 units.

3. A secant has outside length 2 and whole length 18. Another has outside length 3. Find the second secant's inside length. [3 marks]

$2 \times 18 = 3L$, so the second whole length is 12.

Its inside length is $12 - 3 = 9$.

Answer: 9 units.

4. A tangent is 12 cm long. The external point is 13 cm from the centre. Find the circle radius. [2 marks]

$12^2 = 13^2 - r^2$, so $r^2 = 25$.

Answer: 5 cm.

5. A student uses $PT^2 = 3 \times 8$ when a secant has outside part 3 and inside part 8. Correct the calculation. [3 marks]

Use the whole secant length 11, not the inside length 8.

Answer: $PT^2 = 3(3 + 8) = 33$, so $PT = \sqrt{33}$.

6. Intersecting chords have parts x and $x + 3$ on one chord, and 2 and 14 on the other. Find x. [4 marks]

$x(x + 3) = 28$ gives $(x + 7)(x - 4) = 0$.

Reject $x = -7$ because a length is positive.

Answer: $x = 4$.