1. The radius of $\odot A$ is 8 cm. Tangent segment $BC$ is 15 cm long. Find the length of $\overline{AC}$.

![Diagram of circle with tangent and radius]

2. Concentric circles with radii 8 & 10 have center $P$. $\overline{XY}$ is a tangent to the inner circle and is a chord of the outer circle. Find $XY$.

![Diagram of concentric circles with tangent and chord]
5. \( \odot P \) and \( \odot R \) are internally tangent at \( O \). \( P \) is at \((8, 0)\) and \( R \) is at \((19, 0)\).

a. Find the coordinates of \( Q \) and \( S \)

b. Find the length of \( QR \)

9. Given: \( \overline{PW} \) and \( \overline{PZ} \) are common tangents to \( \odot A \) and \( \odot B \) at \( W, X, Y, \) and \( Z \)

Prove: \( WX = YZ \)

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10.

⊙P is tangent to each side of ABCD. AB = 20, BC = 11, and DC = 14. Let AQ = x and find AD.

11.

a. Find the radius of ⊙P

b. Find the slope of the tangent to ⊙P at point Q
13.

The centers of two circles of radii 10 cm and 5 cm are 13 cm apart.

a. Find the length of a common external tangent.

b. Do the circles intersect?

14.

The centers of two circles with radii of 3 and 5 are 10 units apart. Find the length of a common internal tangent.
16. \( \odot A, \odot B, \text{ and } \odot C \) are all externally tangent to each other. AB = 8, BC = 13, and AC = 11. Find the radii of the three \( \odot s \).

22. Find the perimeter of right triangle \( WXY \) if the radius of the circle is 4 and \( WY = 20 \).
23.

B is 34 mm from the center of \( \odot O \), which has radius 16 mm. \( \overline{BP} \) and \( \overline{BR} \) are tangent segments. \( \overline{AC} \) is tangent to \( \odot O \) at point Q. Find the perimeter of \( \triangle ABC \).