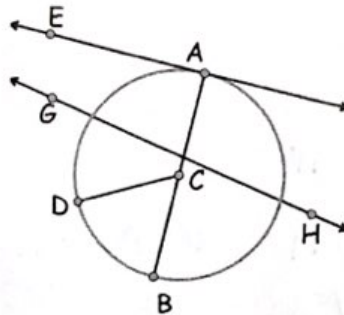


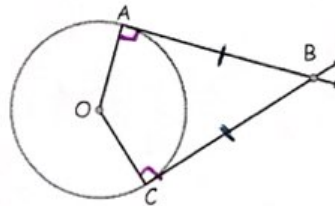
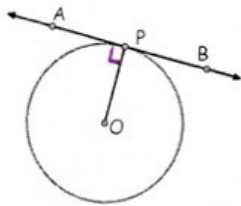
Warm Up

Review of Vocabulary: List an example of each vocab word according to the figure on the right.

- Radius: $\overline{CD}, \overline{CB}, \overline{CA}$
- Diameter: \overline{AB}
- Chord: \overline{AB}
- Tangent Line: \overline{EA}
- Point of Tangency: Point A
- Secant Line: \overline{GH}



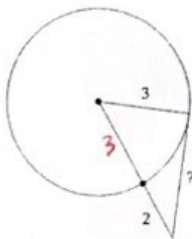
Properties of Tangent Lines:



The tangent line to a circle and the radius are always perpendicular !

Example Sets:

1. Find the segment length indicated. Assume that lines that appear tangent are tangent.



$$3^2 + (?)^2 = 5^2$$

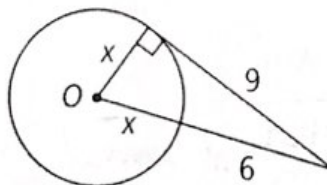
$$9 + ?^2 = 25$$

$$\begin{array}{r} -9 \\ -9 \end{array}$$

$$\sqrt{?^2} = \sqrt{16}$$

$$\boxed{? = 4}$$

2. Solve for x:



$$x^2 + 9^2 = (x+6)^2$$

$$x^2 + 81 = x^2 + 12x + 36$$

$$\begin{array}{r} -x^2 \\ -x^2 \end{array}$$

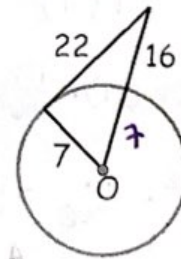
$$81 = 12x + 36$$

$$\begin{array}{r} -36 \\ -36 \end{array}$$

$$\frac{45}{12} = \frac{12x}{12}$$

$$\boxed{x = 3.75}$$

3. Determine if the line which appears to be tangent is tangent to the circle.

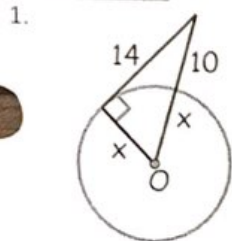


$$22^2 + 7^2 = 23^2$$

$$533 \neq 529$$

NOT tangent.

Guided Practice: Solve for x. Assume that lines which appear to be tangent are tangent.

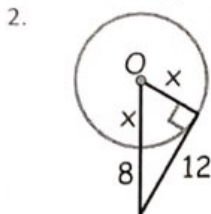


$$x^2 + 14^2 = (x+10)^2$$

$$\begin{array}{r} x^2 + 196 = x^2 + 20x + 100 \\ -x^2 \quad -100 \quad -x^2 \quad -100 \end{array}$$

$$\frac{96}{20} = \frac{20x}{20}$$

$$\boxed{x = 4.8}$$

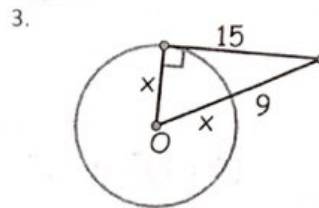


$$x^2 + 12^2 = (x+8)^2$$

$$\begin{array}{r} x^2 + 144 = x^2 + 16x + 64 \\ -x^2 \quad -64 \quad -x^2 \quad -64 \end{array}$$

$$\frac{80}{16} = \frac{16x}{16}$$

$$\boxed{x = 5}$$



$$x^2 + 15^2 = (x+9)^2$$

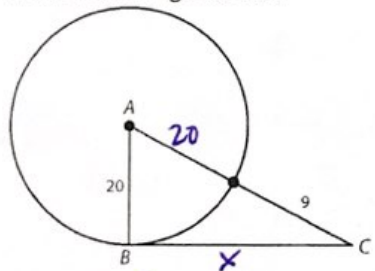
$$\begin{array}{r} x^2 + 225 = x^2 + 18x + 81 \\ -x^2 \quad -81 \quad -x^2 \quad -81 \end{array}$$

$$\frac{144}{18} = \frac{18x}{18}$$

$$\boxed{8 = x}$$

Assume that lines that appear to be tangent to the circle are tangent.

4. What is the length of \overline{BC} ?



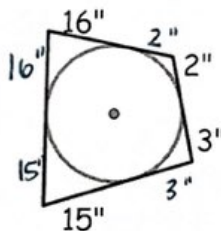
$$20^2 + x^2 = 29^2$$

$$400 + x^2 = 841$$

$$\sqrt{x^2} = \sqrt{441}$$

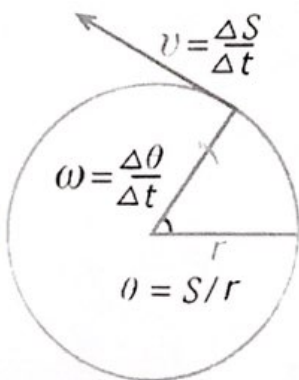
$$\boxed{BC = 21}$$

5. What is the perimeter of the polygon?



$$\boxed{72''}$$

*Tangent lines to circles have plenty of applications when it comes to Centripetal Force & Tangential Velocity.



Linear velocity, $v = \frac{\Delta S}{\Delta t}$

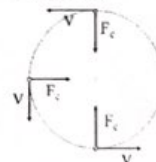
But $S = r \cdot \theta$,
Making $v = \frac{r \cdot \Delta \theta}{\Delta t}$

Or $\boxed{v = r \cdot \omega}$

Centripetal Force:

Force responsible for uniform circular motion.

Always toward center of circle!



Tangential velocity:

Speed and direction of the object at any given time.

Always tangent to the circle!
(perpendicular to the Centripetal Force)