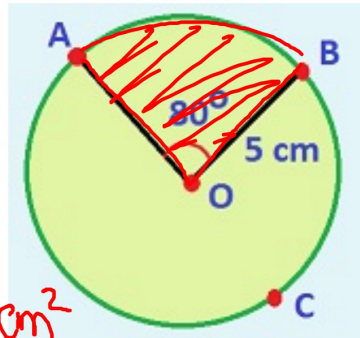


Review

1. Find the arc length and the area of the following sector:

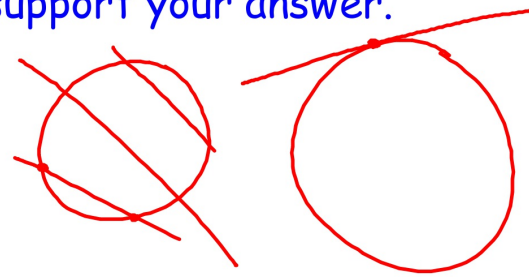
$$A = \pi r^2$$
$$A = (3.14)(5^2)$$
$$A = 78.5 \text{ cm}^2$$

$$\frac{80}{360} = .2 \quad 17.4 \text{ cm}^2$$



Launch:

How many ways can a circle and a line intersect? Draw some examples to support your answer.



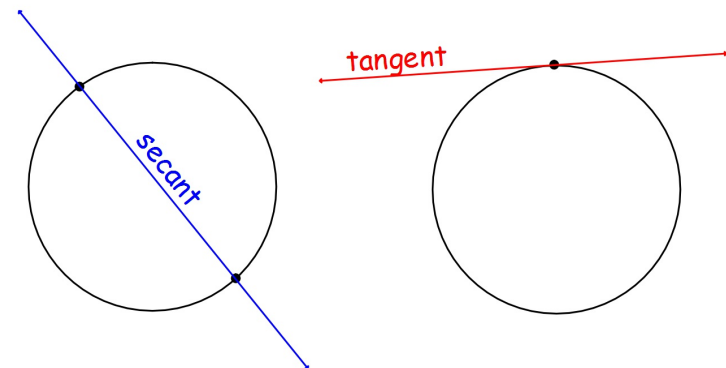
5.10 Secants and Tangents

Objectives: To identify properties of tangents.

To apply the theory of proportion to chords, secants, and tangents of circles.

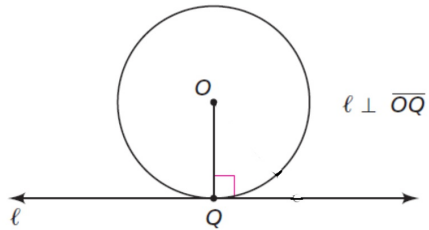
secant: line that intersects a circle at two points

Tangent: When a line only has one intersection point with a circle. "Just touching."



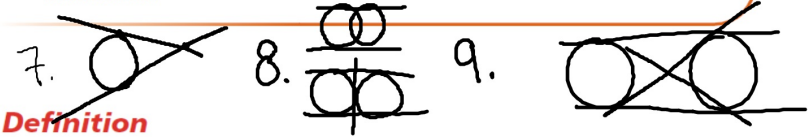
Theorem 5.12

If a line is tangent to a circle, it is perpendicular to the radius drawn to the point of contact.



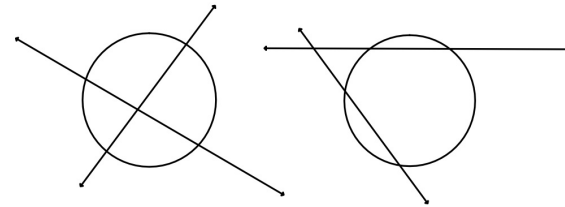
For You to Do

- 7. Draw a circle and a point outside of it. Think of all the tangent lines to the circle through that point. How many are there?
- 8. Draw two circles that intersect. How many lines are tangent to both circles?
- 9. Draw two circles that do not intersect. How many lines are tangent to both circles?



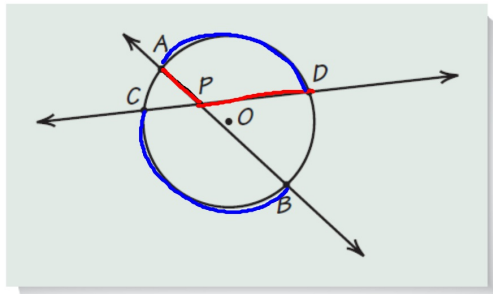
Definition

A **secant angle** is an angle with sides that are two secants of a circle. A secant angle's vertex can be inside or outside the circle.

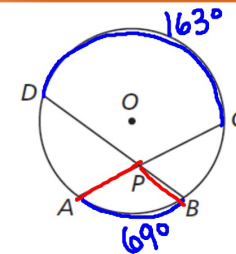


Theorem 5.13 Secant angle with a vertex inside a circle

$$m\angle APD = \frac{1}{2}(m\widehat{AD} + m\widehat{CB})$$



For You to Do

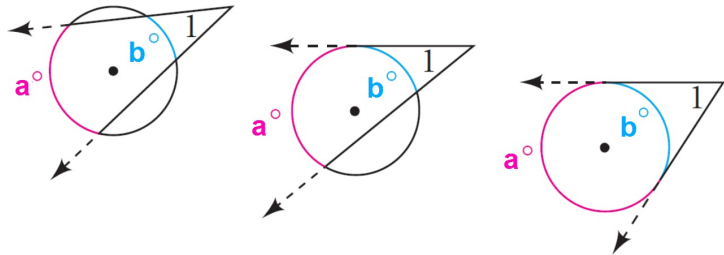


$$\begin{aligned} m\angle APB &= \frac{1}{2}(69 + 163) \\ &= \frac{1}{2}(232) \\ &= 116^\circ \end{aligned}$$

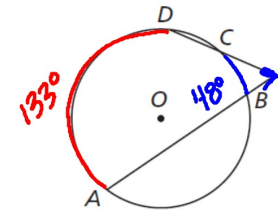
- 10. If $m\widehat{AB} = 69^\circ$ and $m\widehat{DC} = 163^\circ$, what is $m\angle APB$?

Theorem 5-14

$$m\angle 1 = \frac{1}{2}(a - b)$$



For You to Do



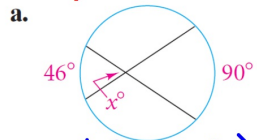
$$m\angle APD = \frac{1}{2}(133 - 48)$$

$$m\angle APD = \frac{1}{2}(85)$$

$$= 42.5^\circ$$

12. If $m\widehat{AD} = 133^\circ$ and $m\widehat{BC} = 48^\circ$, what is $m\angle APD$?

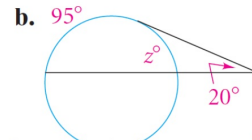
Example Find the value of each variable.



$$x = \frac{1}{2}(46 + 90)$$

$$x = \frac{1}{2}(136)$$

$$x = 68^\circ$$



$$20 = \frac{1}{2}(95 - z)$$

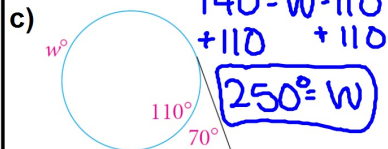
$$\cdot 2 \quad \cdot 2$$

$$40 = 95 - z$$

$$-95 \quad -95$$

$$-55 = -z$$

$$55 = z$$



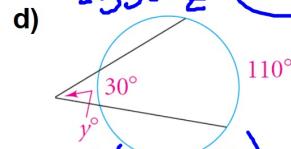
$$140 = w - 110$$

$$+110 \quad +110$$

$$250 = w$$

$$70 = \frac{1}{2}(w - 110)$$

$$\cdot 2 \quad \cdot 2$$



$$y = \frac{1}{2}(110 - 30)$$

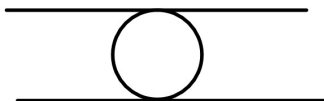
$$y = \frac{1}{2}(80)$$

$$y = 40^\circ$$

On Your Own

Page 411: 7-8

7. Draw two parallel lines and inscribe a circle between them. What can you say about the segment that connects the intersections of the circle with the parallel lines? Explain.



Page 411: 7-8

8. **Standardized Test Prep** Given $m\angle AQF = 22^\circ$ and $m\widehat{QHP} = 110^\circ$, what is $m\angle QRP$?

- A. 67°
- B. 77°
- C. 82°
- D. 88°

