LESSON 10.4

NAME _____ DATE _____

Reteaching with Practice

For use with pages 621–627

GOAL **Use angles formed by tangents and chords to solve problems in geometry and use angles formed by lines that intersect a circle to solve problems**

VOCABULARY

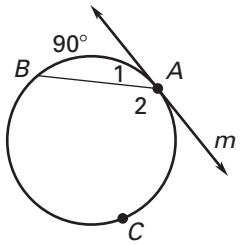
Theorem 10.12
If a tangent and a chord intersect at a point on a circle, then the measure of each angle formed is one half the measure of its intercepted arc.

Theorem 10.13
If two chords intersect in the *interior* of a circle, then the measure of each angle is one half the *sum* of the measures of the arcs intercepted by the angle and its vertical angle.

Theorem 10.14
If a tangent and a secant, two tangents, or two secants intersect in the *exterior* of a circle, then the measure of the angle formed is one half the *difference* of the measures of the intercepted arcs.

EXAMPLE 1 Finding Angle and Arc Measures

Line m is tangent to the circle.



a. Find $m\angle 1$

b. $m\overset{\frown}{ACB}$

SOLUTION

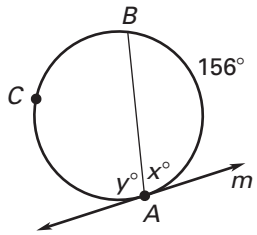
a. $m\angle 1 = \frac{1}{2}(90°) = 45°$

b. Because $\angle 1$ and $\angle 2$ are a linear pair, $m\angle 2 = 180° - m\angle 1 = 180° - 45° = 135°$. So, $m\overset{\frown}{ACB} = 2(135°) = 270°$.

Exercises for Example 1

Find the value of each variable.

1.



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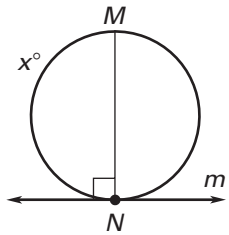

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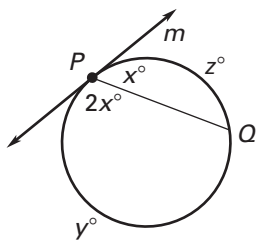

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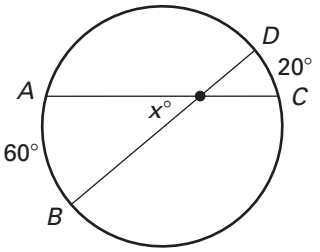
EXAMPLE 2 Using Theorem 10.13

Find the value of x.



SOLUTION

$x^\circ = \frac{1}{2}(m\overset{\frown}{AB} + m\overset{\frown}{CD})$ Apply Theorem 10.13.

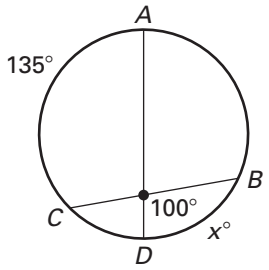
$x^\circ = \frac{1}{2}(60^\circ + 20^\circ)$ Substitute.

$x = 40$ Simplify.

Exercises for Example 2

Find the value of x.

4.



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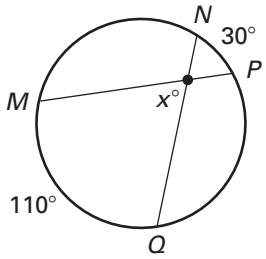

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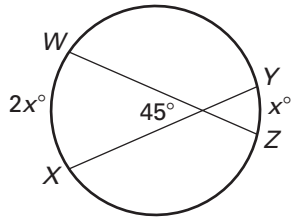
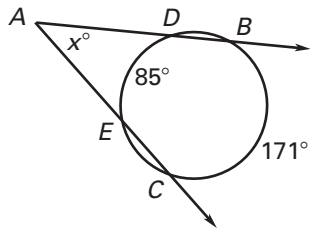


EXAMPLE 3 Using Theorem 10.14

Find the value of x.



SOLUTION

$x^\circ = \frac{1}{2}(m\overset{\frown}{BC} - m\overset{\frown}{DE})$ Apply Theorem 10.14.

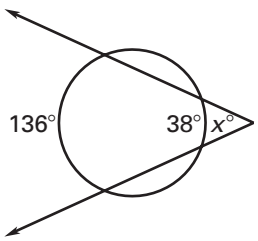
$x^\circ = \frac{1}{2}(171^\circ - 85^\circ)$ Substitute.

$x = 43$ Simplify.

Exercises for Example 3

Find the value of *x*.

7.



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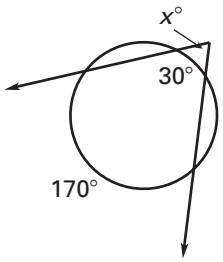

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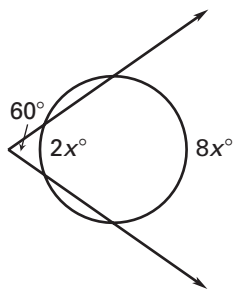

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