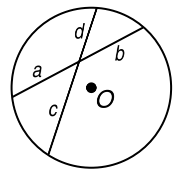
NAME ____ DATE ____________ PERIOD _____

10-7 Study Guide and Intervention

Special Segments in a Circle

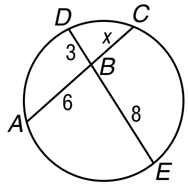
Segments Intersecting Inside a Circle If two chords intersect in a circle, then the products of the measures of the chords are equal.



$a \cdot b = c \cdot d$

Example **Find x.**

The two chords intersect inside the circle, so the products $AB \cdot BC$ and $EB \cdot BD$ are equal.



$AB \cdot BC = EB \cdot BD$

$AB \cdot BC = EB \cdot BD$

$6 \cdot x = 8 \cdot 3$ Substitution

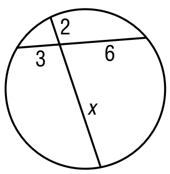
$6x = 24$ Simplify.

$x = 4$ Divide each side by 6.

Exercises

Find x to the nearest tenth.

1.



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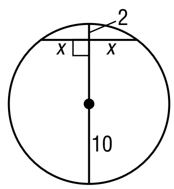

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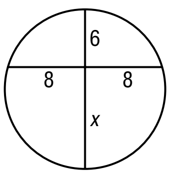

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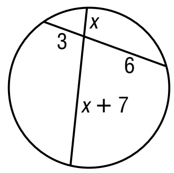

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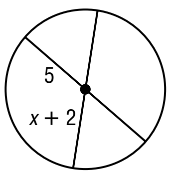

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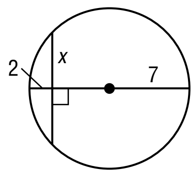

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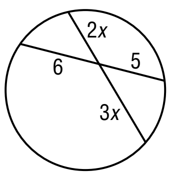

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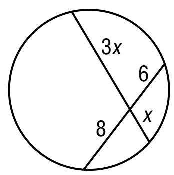


Homework 10.4

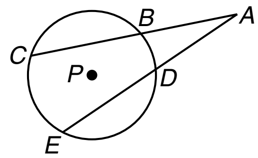
NAME ____ DATE _____________ PERIOD _____

10-7 Study Guide and Intervention *(continued)*

Special Segments in a Circle

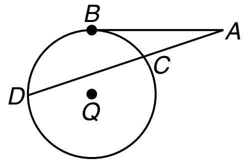
Segments Intersecting Outside a Circle If secants and tangents intersect outside a circle, then two products are equal.

- If two secant segments are drawn to a circle from an exterior point, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.



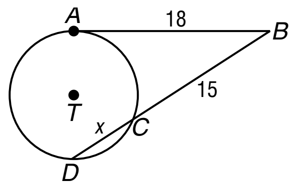
$\overline{AC}$ and $\overline{AE}$ are secant segments.
$\overline{AB}$ and $\overline{AD}$ are external secant segments.
$AC \cdot AB = AE \cdot AD$

- If a tangent segment and a secant segment are drawn to a circle from an exterior point, then the square of the measure of the tangent segment is equal to the product of the measures of the secant segment and its external secant segment.



$\overline{AB}$ is a tangent segment.
$\overline{AD}$ is a secant segment.
$\overline{AC}$ is an external secant segment.
$(AB)^2 = AD \cdot AC$

Example **Find x to the nearest tenth.**



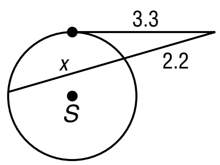
The tangent segment is $\overline{AB}$, the secant segment is $\overline{BD}$, and the external secant segment is $\overline{BC}$.

$(AB)^2 = BC \cdot BD$
$(18)^2 = 15(15 + x)$
$324 = 225 + 15x$
$99 = 15x$
$6.6 = x$

Exercises

Find x to the nearest tenth. Assume segments that appear to be tangent are tangent.

1.



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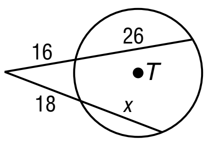

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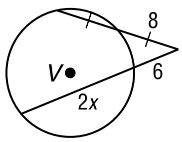

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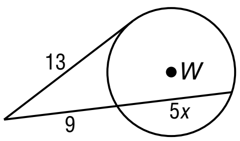

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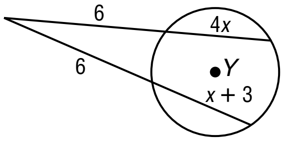

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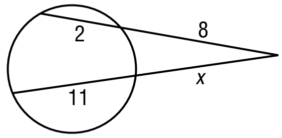

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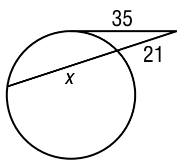

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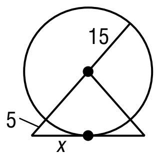

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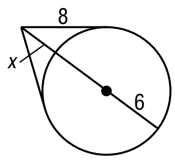

Homework 10.4

NAME ______________________________ DATE ____________ PERIOD _____

10-7 Skills Practice

Special Segments in a Circle

Find x to the nearest tenth. Assume that segments that appear to be tangent are tangent.

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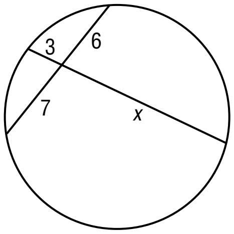

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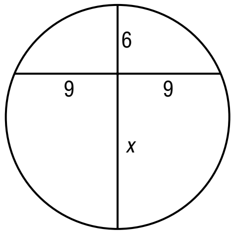

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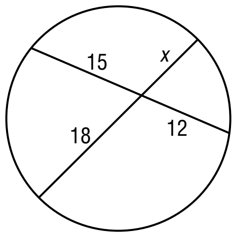

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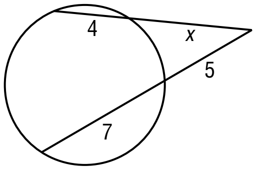

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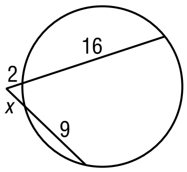

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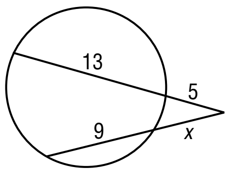

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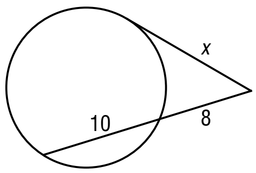

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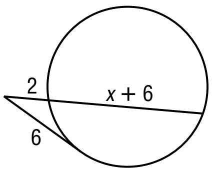

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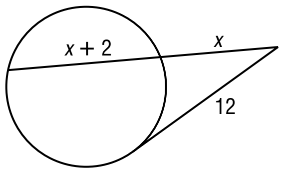


Lesson 10-7

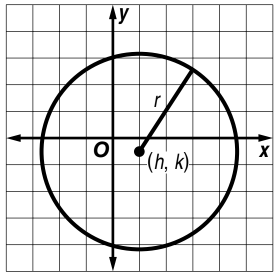
Homework 10.4

NAME ______________________________ DATE __________ PERIOD _____

10-8 Study Guide and Intervention

Equations of Circles

Equation of a Circle A **circle** is the locus of points in a plane equidistant from a given point. You can use this definition to write an equation of a circle.



Standard Equation of a Circle	An equation for a circle with center at (h, k) and a radius of r units is $(x - h)^2 + (y - k)^2 = r^2$.

Example **Write an equation for a circle with center (−1, 3) and radius 6.**

Use the formula $(x - h)^2 + (y - k)^2 = r^2$ with $h = -1$, $k = 3$, and $r = 6$.

$(x - h)^2 + (y - k)^2 = r^2$ Equation of a circle

$(x - (-1))^2 + (y - 3)^2 = 6^2$ Substitution

$(x + 1)^2 + (y - 3)^2 = 36$ Simplify.

Exercises

Lesson 10-8

Write an equation for each circle.

1. center at $(0, 0)$, $r = 8$

2. center at $(-2, 3)$, $r = 5$

3. center at $(2, -4)$, $r = 1$

4. center at $(-1, -4)$, $r = 2$

5. center at $(-2, -6)$, diameter $= 8$

6. center at $\left(-\frac{1}{2}, \frac{1}{4}\right)$, $r = \sqrt{3}$

7. center at the origin, diameter $= 4$

8. center at $\left(1, -\frac{5}{8}\right)$, $r = \sqrt{5}$

9. Find the center and radius of a circle with equation $x^2 + y^2 = 20$.

10. Find the center and radius of a circle with equation $(x + 4)^2 + (y + 3)^2 = 16$.

Homework 10.4

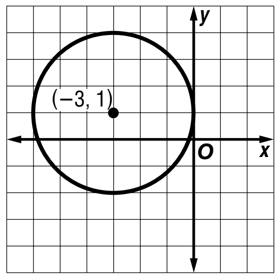
NAME ____ DATE ____________ PERIOD _____

10-8 Study Guide and Intervention *(continued)*

Equations of Circles

Graph Circles If you are given an equation of a circle, you can find information to help you graph the circle.

Example **Graph $(x + 3)^2 + (y - 1)^2 = 9$.**



Use the parts of the equation to find (h, k) and r.

$(x - h)^2 + (y - k)^2 = r^2$

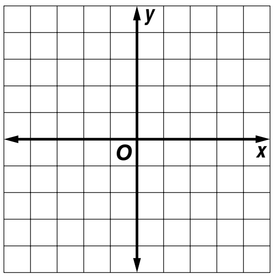
$(x - h)^2 = (x + 3)^2$	$(y - k)^2 = (y - 1)^2$	$r^2 = 9$
$x - h = x + 3$	$y - k = y - 1$	$r = 3$
$-h = 3$	$-k = -1$	
$h = -3$	$k = 1$	

The center is at $(-3, 1)$ and the radius is 3. Graph the center.
Use a compass set at a radius of 3 grid squares to draw the circle.

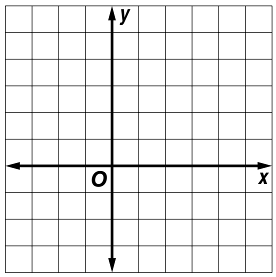
Exercises

Graph each equation.

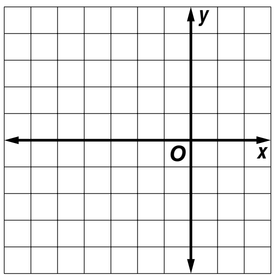
1. $x^2 + y^2 = 16$



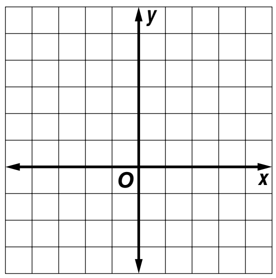
2. $(x - 2)^2 + (y - 1)^2 = 9$



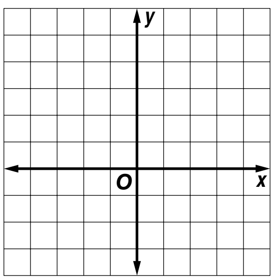
3. $(x + 2)^2 + y^2 = 16$



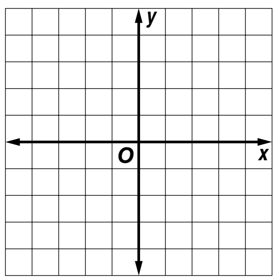
4. $(x + 1)^2 + (y - 2)^2 = 6.25$



5. $\left(x + \frac{1}{2}\right)^2 + \left(y - \frac{1}{4}\right)^2 = 4$



6. $x^2 + (y - 1)^2 = 9$



Homework 10.4

NAME ____ DATE ____________ PERIOD _____

10-8 Skills Practice

Equations of Circles

Write an equation for each circle.

1. center at origin, $r = 6$

2. center at $(0, 0)$, $r = 2$

3. center at $(4, 3)$, $r = 9$

4. center at $(7, 1)$, $d = 24$

5. center at $(-5, 2)$, $r = 4$

6. center at $(6, -8)$, $d = 10$

7. a circle with center at $(8, 4)$ and a radius with endpoint $(0, 4)$

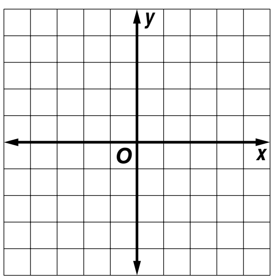
8. a circle with center at $(-2, -7)$ and a radius with endpoint $(0, 7)$

9. a circle with center at $(-3, 9)$ and a radius with endpoint $(1, 9)$

10. a circle whose diameter has endpoints $(-3, 0)$ and $(3, 0)$

Graph each equation.

11. $x^2 + y^2 = 16$



12. $(x - 1)^2 + (y - 4)^2 = 9$