

10.1 Start Thinking

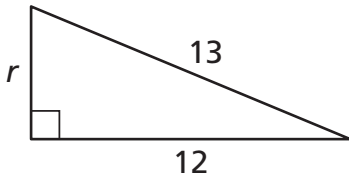
On a piece of graph paper, draw a circle that has a radius of 5 and center at $(0, 0)$.

1. Draw the segment that connects the points $(3, 4)$ and $(-4, -3)$ on the circle. Is this segment a diameter? Explain your answer.
2. Draw the segment that connects the point $(3, -4)$ with the origin. What is the name of this segment? Explain your answer.
3. Is it possible to draw a line that intersects the circle only once? Is it possible to draw a line that intersects the circle more than twice? If so, add an example of these lines to your drawing.

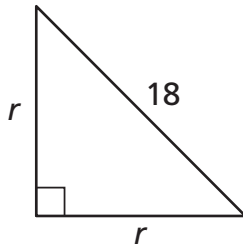
10.1 Warm Up

Find the value of r .

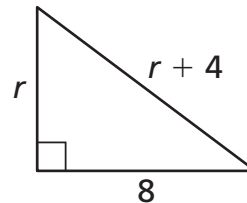
1.



2.



3.



10.1 Cumulative Review Warm Up

Determine if the segment lengths form a triangle. If so, is the triangle acute, obtuse, or right?

1. 3, 7, and 9

2. 14, 7, and 20

3. $\frac{9}{2}$, 6, and $\frac{15}{2}$

4. $\frac{11}{5}$, $\frac{7}{2}$, and $\frac{19}{5}$

5. 4, 4, and 6

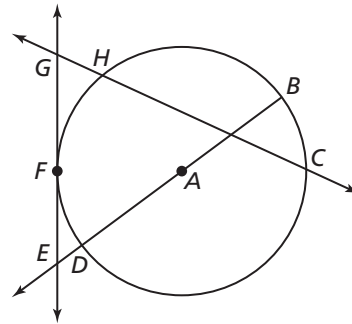
6. 10, 20, and 30

10.1

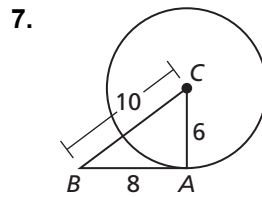
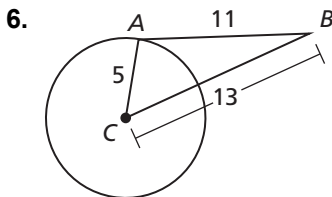
Practice A

In Exercises 1–5, use the diagram.

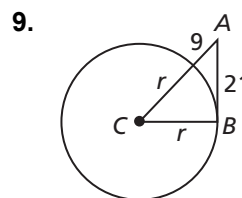
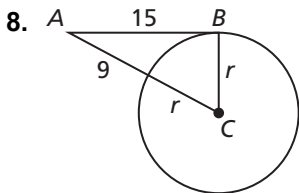
1. Name the circle.
2. Name two radii.
3. Name two chords.
4. Name a secant.
5. Name a tangent.



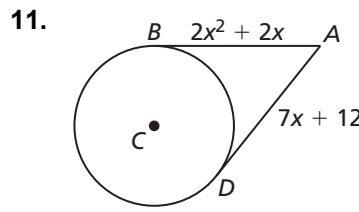
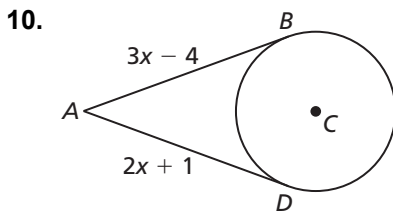
In Exercises 6 and 7, tell whether \overline{AB} is tangent to $\odot C$. Explain your reasoning.



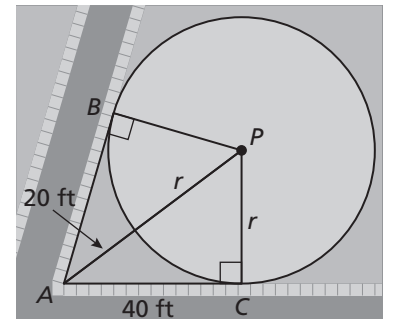
In Exercises 8 and 9, point B is a point of tangency. Find the radius r of $\odot C$.



In Exercises 10 and 11, points B and D are points of tangency. Find the value(s) of x .



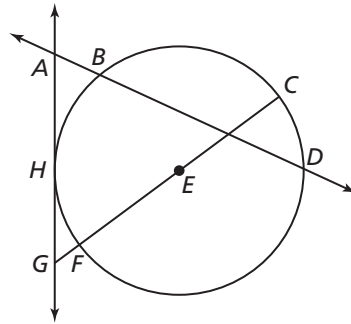
12. Construct $\odot C$ with a 1-inch radius and a point A outside of $\odot C$. Then construct a line tangent to $\odot C$ that passes through A .
13. Two sidewalks are tangent to a circular park centered at P , as shown.
 - a. What is the length of sidewalk \overline{AB} ? Explain.
 - b. What is the diameter of the park?



10.1

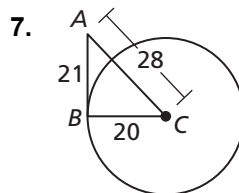
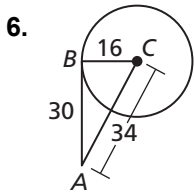
Practice B

In Exercises 1–5, use the diagram.

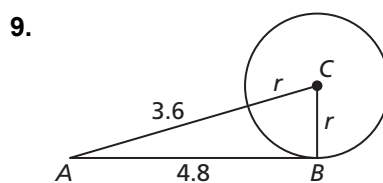
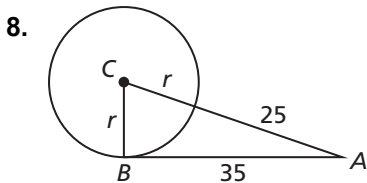


1. Name two radii.
2. Name two chords.
3. Name a diameter.
4. Name a secant.
5. Name a tangent and a point of tangency.

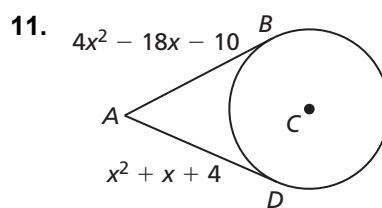
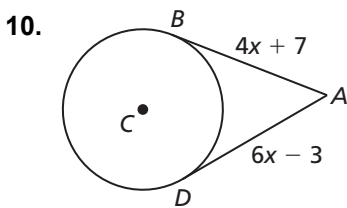
In Exercises 6 and 7, tell whether \overline{AB} is tangent to $\odot C$. Explain your reasoning.



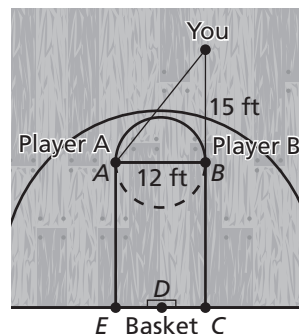
In Exercises 8 and 9, point B is a point of tangency. Find the radius r of $\odot C$.



In Exercises 10 and 11, points B and D are points of tangency. Find the value(s) of x .



12. When will two circles have no common tangents? Justify your answer.
13. During a basketball game, you want to pass the ball to either Player A or Player B. You estimate that Player B is about 15 feet from you, as shown.



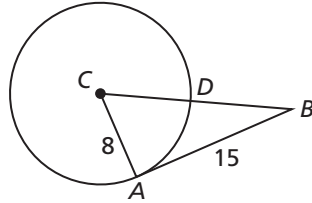
- a. How far away from you is Player A?
- b. How can you prove that Player A and Player B are the same distance from the basket?

10.1

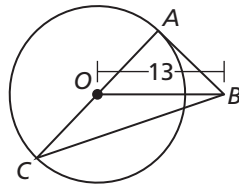
Enrichment and Extension

Lines and Segments That Intersect Circles

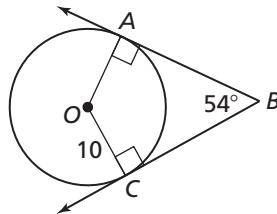
1. In the figure, \overline{AB} is tangent to circle C . Find the length of \overline{DB} .



2. In the figure, $OB = 13$ and \overline{AB} is tangent to circle O , whose diameter \overline{AC} has a length of 18. Find BC .



3. In the figure, $OC = 10$, $m\angle ABC = 54^\circ$, and \overline{BA} and \overline{BC} are tangents to circle O . Find BC .

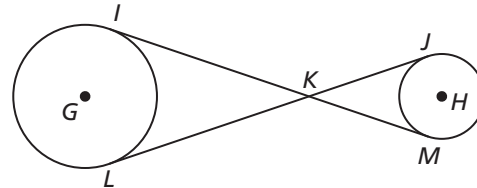


4. Write a paragraph proof for the following.

Given: Circle G and circle H

\overline{IM} and \overline{JL} are common tangents.

Prove: $\overline{IM} \cong \overline{JL}$



10.1 Puzzle Time

Why Did The Scientists Stay At The Math Teacher's House?

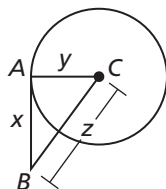
Write the letter of each answer in the box containing the exercise number.

Complete the sentence.

- Coplanar circles that intersect in one point are called _____ circles.
- A chord is a segment whose _____ are on a circle.
- A diameter is a(n) _____ that contains the center of the circle.
- A(n) _____ is a line that intersects a circle in two points.
- A tangent is a line in the plane of a circle that intersects the circle in exactly one point, the point of _____.
- Coplanar circles that have a common center are called _____ circles.
- A line or segment that is tangent to two coplanar circles is called a(n) _____ tangent.
- In a plane, a line is tangent to a circle if and only if the line is _____ to a radius of the circle at its endpoint on the circle.
- Tangent segments from a common external point are _____.

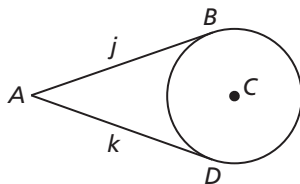
Find the indicated answers using the diagram.

- Given $x = 28$, $y = 45$, and $z = 53$, is \overline{AB} tangent to circle C ? Yes or no?
- Find the radius y of circle C , given that $x = 12$ and $z = y + 8$.



B and D are points of tangency. Find the value of x using the diagram.

- $j = 3x + 1$, $k = 4x - 5$
- $j = x^2 - 2x + 3$, $k = 4x - 6$
- $j = 8x + 5$, $k = 4x + 6$



Answers	
G. yes	
B. connected	
A. lines	I. chord
E. common	C. radius
P. perpendicular	
M. cotangent	
S. tangent	L. urgency
E. 0.25	H. secant
U. consistent	R. 5
T. 0.5	
N. endpoints	
A. no	
W. congruent	
S. unique	R. parallel
A. tangency	
V. concentric	
N. 8	R. 2
I. 3	M. negative
S. 6	D. 7

4	14		9	5	12		1	7	11	6	13	2	10		8	3
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