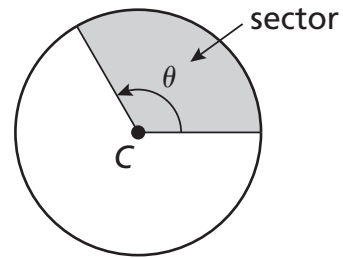


## 11.2 Start Thinking

The circle in the diagram has a diameter of 14 inches. What is the area of the circle? Use the area of the circle to calculate the area of the sector created by the given measure of  $\theta$ .



1.  $\theta = 180^\circ$
2.  $\theta = 270^\circ$
3.  $\theta = 100^\circ$

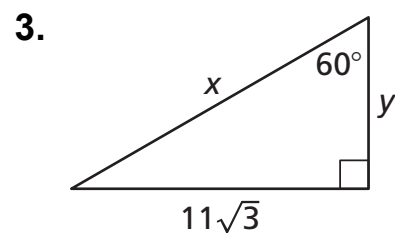
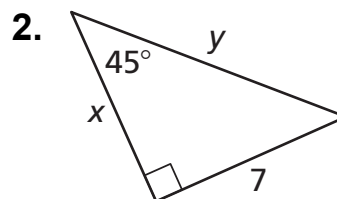
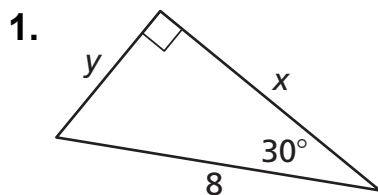
## 11.2 Warm Up

Find the indicated measure.

1. area of a circle with a radius of 9 inches
2. area of a circle with a diameter of 4 feet
3. radius of a circle with an area of 100 square miles
4. diameter of a circle with an area of 42 square meters
5. area of a circle with a circumference of  $12\pi$  centimeters

## 11.2 Cumulative Review Warm Up

Find the values of  $x$  and  $y$  without using a calculator. Write your answers in simplest form.



# 11.2 Puzzle Time

## What Driver Goes Around In Circles?

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

**Complete the sentence.**

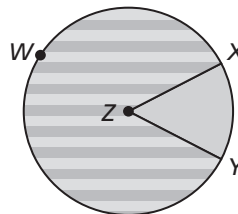
1. A(n) \_\_\_\_\_ of a circle is the region bounded by two radii of the circle and their intercepted arc.
2. The \_\_\_\_\_ density of a city, county, or state is a measure of how many people live within a given area.

**Find the indicated measurement. Round your answer to the nearest hundredth.**

3. area of a circle with radius 3 inches
4. area of a circle with diameter 12 feet
5. radius of a circle with area 42 square feet
6. radius of a circle with area 425 square inches
7. diameter of a circle with area 24.8 square inches
8. diameter of a circle with area  $284\pi$  square centimeters
9. About 180,000 people live in a region with a 10-mile radius. Find the population density in people per square mile. Round your answer to the nearest hundredth.

**Find the area of the indicated sector using the diagram. Round your answer to the nearest hundredth, if necessary.**

10.  $m\angle Z = 48^\circ$ ,  $ZY = 6$ ; Find the area in square units of the sector  $XZY$ .
11. area of sector  $XYZ = 50$ ,  $m\angle Z = 60^\circ$ ; Find the area in square units of  $\odot Z$ .
12.  $m\angle Z = 55^\circ$ ,  $ZY = 7$ ; Find the area in square units of the sector  $XWY$ .



Answers	
K. 320	C. 3.66
H. 5.03	R. 572.96
X. 7.32	W. sector
S. 23.26	R. population
T. section	D. 246.88
A. 28.27	D. 33.70
M. high	A. 18.84
E. 11.63	R. triangle
R. 113.10	L. 452.16
V. 15.08	C. 11.24
E. 130.42	S. 5.62
T. 16.85	I. 300
W. 120.42	

3		7	5	9	12	1	8	4	11	10	6	2
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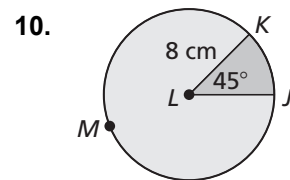
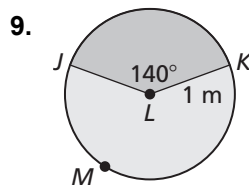
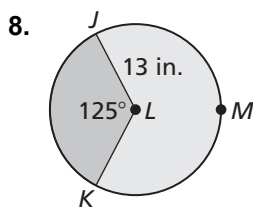
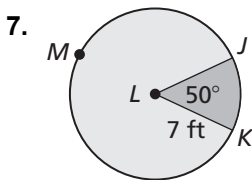
# 11.2

## Practice A

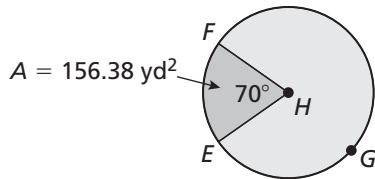
In Exercises 1–4, find the indicated measure.

- area of a circle with a radius of 6.8 feet
- area of a circle with a diameter of 19.2 centimeters
- radius of a circle with an area of 1017.9 square meters
- diameter of a circle with an area of 707 square inches
- About 1.2 million people live in a region with a 6-mile radius. Find the population density in people per square mile.
- A region with a 15-mile diameter has a population density of about 5000 people per square mile. Find the number of people who live in the region.

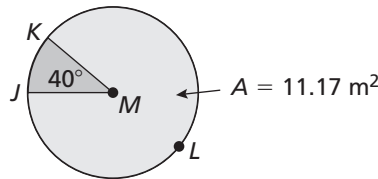
In Exercises 7–10, find the areas of the sectors formed by  $\angle JLK$ .



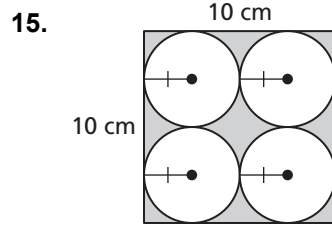
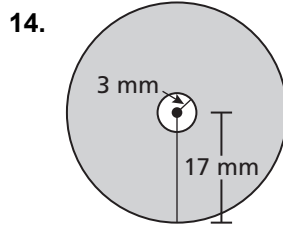
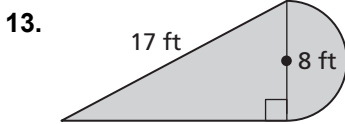
11. Find the area of  $\odot H$ .



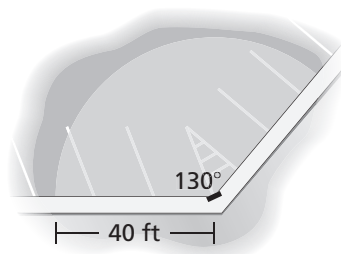
12. Find the area of  $\odot M$ .



In Exercises 13–15, find the area of the shaded region.



16. The diagram shows the coverage of a security camera outside a building. A new security camera is installed in the same position that doubles the radius of the coverage area. How does this affect the coverage area? Explain.



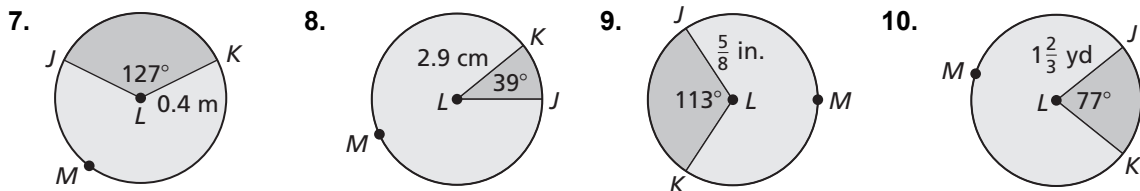
# 11.2

## Practice B

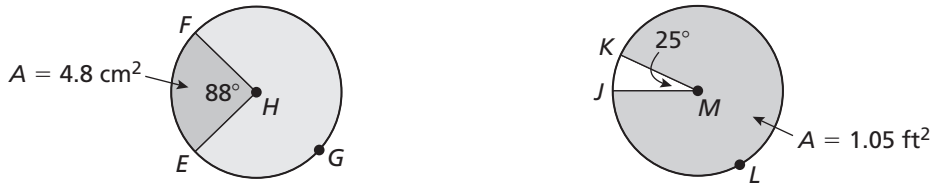
In Exercises 1–4, find the indicated measure.

- area of a circle with a radius of 6.75 inches
- area of a circle with a diameter of  $\frac{3}{10}$  mile
- radius of a circle with an area of 63.7 square kilometers
- diameter of a circle with an area of 1040.62 square yards
- About 150,000 people live in a circular region with a population density of about 1578 people per square mile. Find the radius of the region.
- About 1.75 million people live in a circular region with a population density of about 5050 people per square mile. Find the radius of the region.

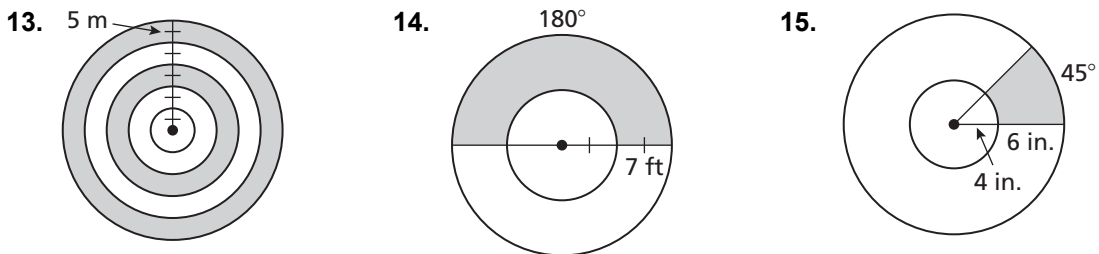
In Exercises 7–10, find the areas of the sectors formed by  $\angle JLK$ .



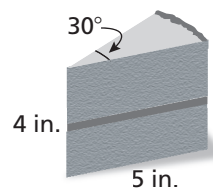
- Find the radius of  $\odot H$ .
- Find the radius of  $\odot M$ .



In Exercises 13–15, find the area of the shaded region.



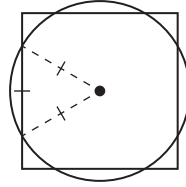
- A piece of cake is a sector of a cylinder as shown. What is the volume of the piece of cake?



# 11.2 Enrichment and Extension

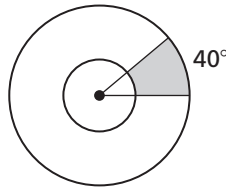
## Areas of Circles and Sectors

1. A square and a circle intersect so that each side of the square contains a chord of the circle equal in length to the radius of the circle. What is the ratio of the area of the square to the area of the circle?



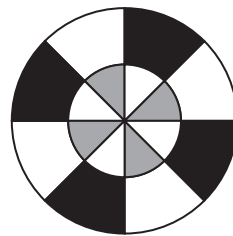
2. If the area of a sector is one-tenth of the area of the circle, what is the central angle of the sector?

3. In the diagram, the larger of the two concentric circles has a radius of 5 meters, and the smaller circle has a radius of 2 meters. What is the area of the shaded region in terms of  $\pi$ ?



4. Circle  $O$  is inscribed in equilateral triangle  $ABC$  and tangent to the sides of the triangle. If the area of  $\triangle ABC$  is  $24\sqrt{3}$  square units, what is the area of circle  $O$ ?

5. The central angles of a target measure  $45^\circ$ . The inner circle has a radius of 1 foot, and the outer circle has a radius of 2 feet. Assuming that all arrows hit the target at random, find the following probabilities.



- a. hitting a gray region
- b. hitting a black region
- c. hitting a gray or black region

6.  $\triangle ABC$  is formed by joining the centers of three congruent tangent circles. If the radius of each circle is 6 centimeters, find the area of  $\triangle ABC$ .

7. Consider an arc of a circle with a radius of 3 inches.

- a. Copy and complete the table. Leave your answers in terms of  $\pi$ .

Measure of arc, $x$	$30^\circ$	$60^\circ$	$90^\circ$	$120^\circ$	$150^\circ$	$180^\circ$
Area of sector, $y$						

- b. Write an equation that represents the relationship between  $x$  and  $y$ .