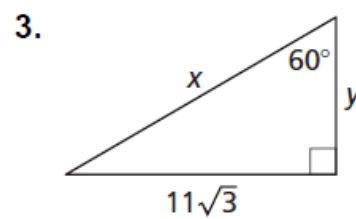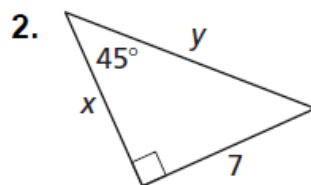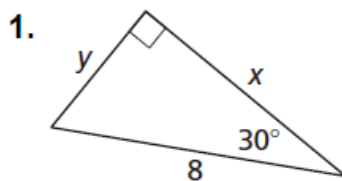# 11.2 Area of Circles and Sectors

Essential Question

How can you find the area of a sector of

a circle?

Find the values of x and y without using a calculator. Write

your answers in simplest form.

1.

y

x

30°

8

2.

45°

y

x

7

3.

x

60°

y

$11\sqrt{3}$

Core Concept

Area of a Circle

The area of a circle is

$$A = \pi r^2$$

where r is the radius of the circle.

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 centimeters

a. About 430,000 people live in a 5-mile radius of a city's town hall. Find the population density in people per square mile.

b. A region with a 3-mile radius has a population density of about 6195 people per square mile. Find the number of people who live in the region.
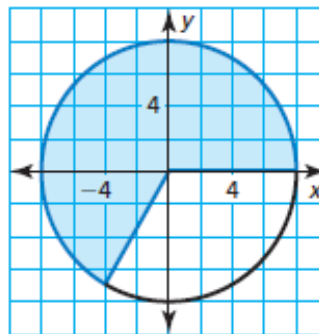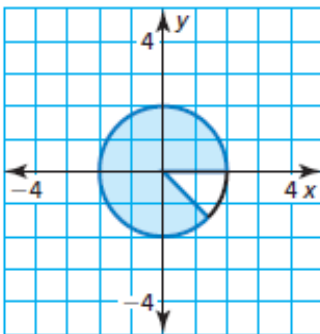
<u>Exploration</u>

Work with a partner.   A sector of a circle is the region bounded by two radii of the circle and their intercepted arc. Find the area of each shaded circle or sector of a circle.

a
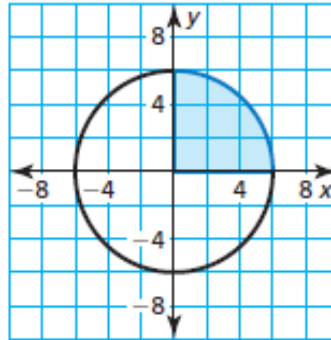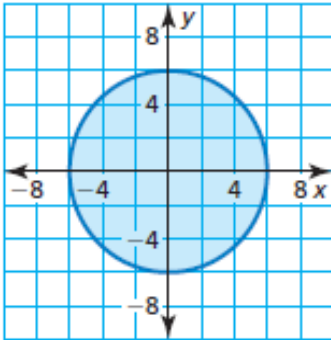
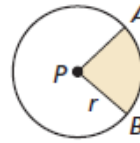c. seven-eighths of a circle   d. two-thirds of a circle
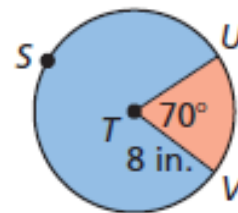
Core Concept

Area of a Sector

The ratio of the area of a sector of a circle to the area of the whole circle (πr^2) is equal to the ratio of the measure of the intercepted arc to $360°$.

$$\frac{\text{Area of sector } APB}{\pi r^2} = \frac{m\overset{\frown}{AB}}{360°}, \text{ or}$$
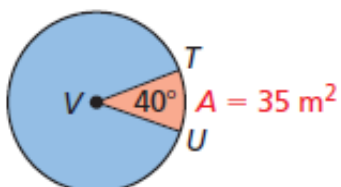
$$\text{Area of sector } APB = \frac{m\overset{\frown}{AB}}{360°} \cdot \pi r^2$$

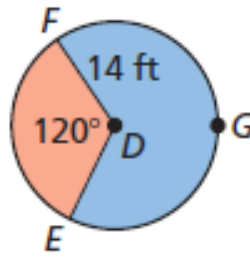Find the areas of the sectors formed by $\angle$ UTV.
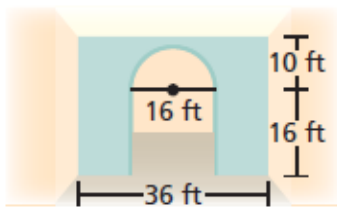
Find the area of $\odot$V.

Find the indicated measure.
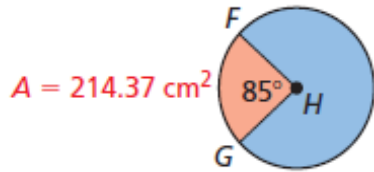

5. area of red sector
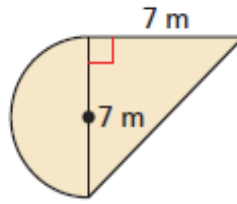
6. area of blue sector

A rectangular wall has an entrance cut into it. You want to paint the wall. To the nearest square foot, what is the area of the region you need to paint?

7. Find the area of ⊙H.

$A = 214.37$ cm^2 85°

F, 85°, H, G

8. Find the area of the figure.

7 m

7 m

Work with a partner. A center pivot irrigation system consists of 400 meters of sprinkler equipment that rotates around a central pivot point at a rate of once every 3 days to irrigate a circular region with a diameter of 800 meters. Find the area of the sector that is irrigated by this system in one day.