

LESSON
11.5**Study Guide**

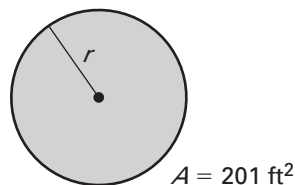
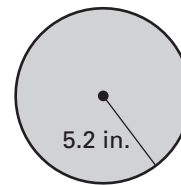
For use with pages 755–761

GOAL Find the areas of circles and sectors.**Vocabulary**

A **sector of a circle** is the region bounded by two radii of the circle and their intercepted arc.

Theorem 11.9 Area of a circle: The area of a circle is π times the square of the radius.

Theorem 11.10 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° .

EXAMPLE 1 Use the formula for area of a circle**Find the indicated measure.****a.** Radius**b.** Area**Solution**

- a.** $A = \pi r^2$ Write the formula for area of a circle.
 $201 = \pi r^2$ Substitute 201 for A .
 $\frac{201}{\pi} = r^2$ Divide each side by π .
 $8 \approx r$ Find the positive square root of each side.

The radius of the circle is about 8 feet.

- b.** $A = \pi r^2$ Write the formula for area of a circle.
 $= \pi \cdot (5.2)^2$ Substitute 5.2 for r .
 $= 27.04\pi$ Simplify.
 ≈ 84.9 Use a calculator.

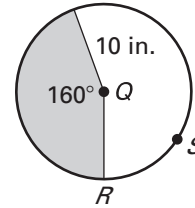
The area of the circle is about 84.9 square inches.

Exercises for Example 1**Find the indicated measure.**

- The diameter of the circle is 11 centimeters. Find the area.
- The area of the circle is 158.3 square yards. Find the radius.
- The area of circle is 1024π square meters. Find the diameter.

LESSON
11.5**Study Guide** *continued*
For use with pages 755–761**EXAMPLE 2** Find the areas of sectorsFind the areas of the sectors formed by $\angle PQR$.**Solution****STEP 1** Find the measures of the minor and major arcs.

Because $m\angle PQR = 160^\circ$, $m\widehat{PR} = 160^\circ$ and
 $m\widehat{PSR} = 360^\circ - 160^\circ = 200^\circ$.

**STEP 2** Find the areas of the small and large sectors.

$$\text{Area of small sector} = \frac{160^\circ}{360^\circ} \cdot \pi \cdot 10^2 \approx 139.62$$

$$\text{Area of large sector} = \frac{200^\circ}{360^\circ} \cdot \pi \cdot 10^2 \approx 174.54$$

So, the areas of the small and large sectors are about 139.62 square inches and 174.54 square inches, respectively.

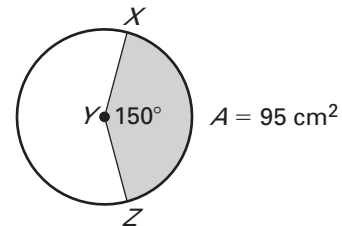
EXAMPLE 3 Use the Area of a Sector TheoremUse the diagram to find the area of $\odot Y$.**Solution**

$$\text{Area of sector } XYZ = \frac{m\widehat{XY}}{360^\circ} \cdot \text{Area of } \odot Y$$

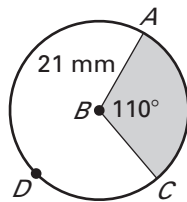
$$95 = \frac{150^\circ}{360^\circ} \cdot \text{Area of } \odot Y$$

$$228 = \text{Area of } \odot Y$$

The area of $\odot Y$ is 228 square centimeters.

**Exercises for Examples 2 and 3**

4. Find the areas of the sectors formed by $\angle ABC$.



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

