Geometry Lesson 35

Objective: TSW find arc length and areas of sectors.
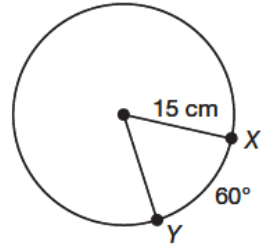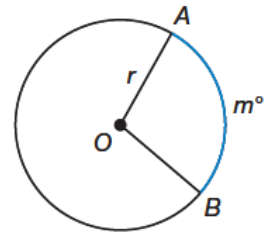
Arc Length - To find the length of an arc, use this formula, where *m* is the degree measure of the arc.

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Example 1 Finding Arc Length

Find each arc length. Give your answer in terms of π.

a. Find the length of $\widehat{XY}$.

  SOLUTION

b. Find the length of an arc with a measure of 75° in a circle with a radius of 4 feet.

  SOLUTION

Sector of a Circle - The region inside a circle bounded by two radii of the circle and their intercepted arc.

Area of a Sector - To find the area of a sector (*A*), use the following formula, where *r* is the circle's radius and *m* is the central angle measure:

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Example 2 Finding the Area of a Sector

Find the area of each sector. Give your answer in terms of π.

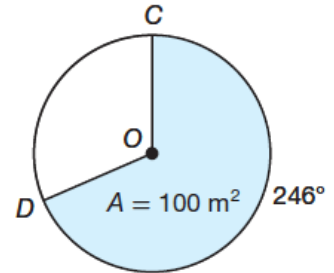a. Find the area of sector *XOY*.

  SOLUTION
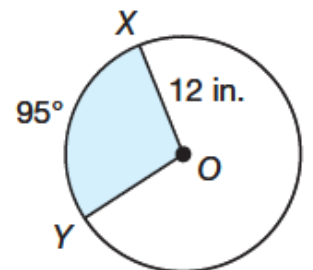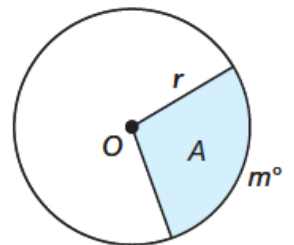
b. Find the area of a sector with an arc that measures 174° in a circle with a radius of 13 meters.

Example 3 Solving for Unknown Radius
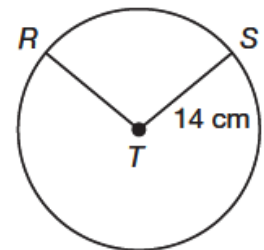Find the radius of the circle to the nearest hundredth of a meter.
    SOLUTION
    Substitute the known measures into the formula for the area of a sector, then
    solve for r.

Example 4 Solving for Unknown Central Angle
Find the central angle measure of $\widehat{RS}$ to the nearest hundredth of a degree, if the length of the arc is 12 centimeters.
    SOLUTION

Example 5 Application: Farming
A spray irrigation system has a radius of 150 feet. If it rotates through a 175° central angle, what is the area that the system covers? Round your answer to the nearest square foot.
    SOLUTION

You Try!!!

a. Find the length of an arc with a measure of 125° in a circle and 12-mile radius. Round to the nearest hundredth of a mile.

c. Find the radius to the nearest hundredth of a centimeter.