

**Bellwork**  
**04/18/12**

1. Find the length of a  $60^\circ$  arc in a circle with radius 8 m.

$$\begin{aligned} & \frac{60}{360} \cdot 2(8)\pi \\ & \frac{1}{3} \cdot \frac{8 \cdot 16\pi}{1} \\ & = \frac{8\pi}{3} \approx 8.38 \text{ m} \end{aligned}$$

**Geometry**  
**11.5 Areas of Circles and Sectors**  
**Standard(s): 4**

### Vocabulary:

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

#### THEOREM

*For Your Notebook*

#### THEOREM 11.9 Area of a Circle

The area of a circle is  $\pi$  times the square of the radius.

*Justification:* Ex. 43, p. 761; Ex. 3, p. 769



$$A = \pi r^2$$

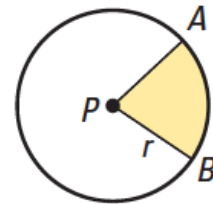
#### THEOREM

*For Your Notebook*

#### 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 ( $\pi r^2$ ) is equal to the ratio of the measure of the intercepted arc to  $360^\circ$ .

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



## Area of Circles

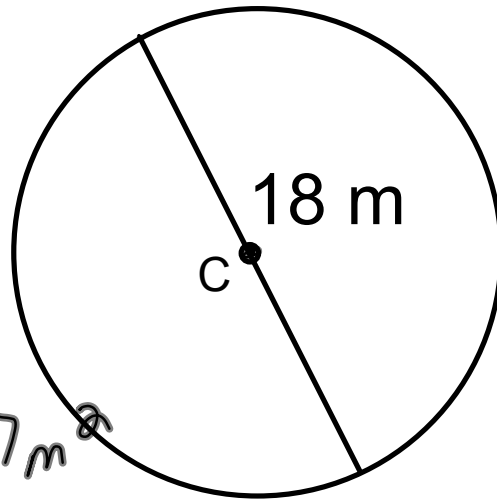
Find the exact area of the circle. Then find the area to the nearest hundredth.

$$d = 18$$

$$r = 9$$

$$A = 9^2 \pi$$

$$A = 81\pi \approx 254.47 \text{ m}^2$$



## Find Area of Sectors

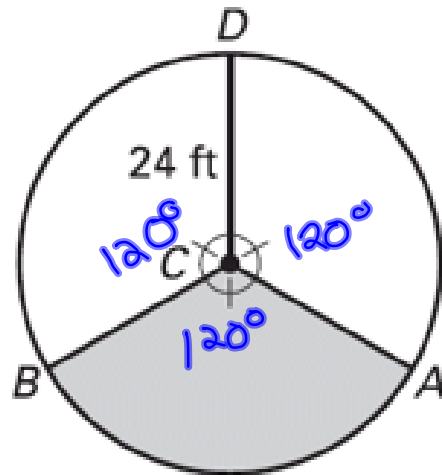
Find the area of the sector created by  $\angle ACB$ .

$$A.S. = \frac{120}{360} \cdot 576\pi$$

$$A.S. = \frac{1}{3} \cdot \frac{576\pi}{1}$$

$$A.S. = 192\pi \text{ ft}^2$$

$$\approx 603.19 \text{ ft}^2$$



$$A = r^2 \pi$$

$$A = 24^2 \pi$$

$$A = 576\pi$$

## Find Measures

Find the indicated measure.

1. The area of a circle is  $106 \text{ cm}^2$ . Find the diameter.

$$A = r^2 \pi$$

$$\frac{106}{\pi} = \frac{r^2 \pi}{\pi}$$

$$\sqrt{r^2} = \sqrt{\frac{106}{\pi}}$$

$$r = \sqrt{\frac{106}{\pi}}$$

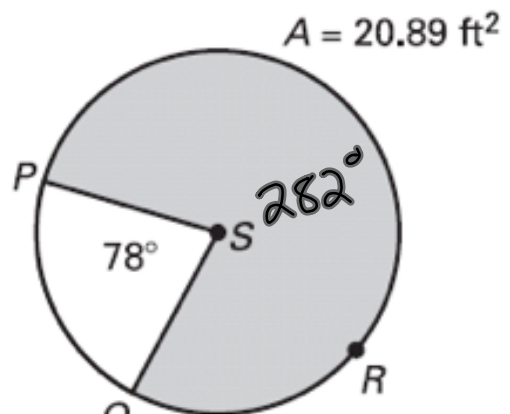
$$d = 2 \sqrt{\frac{106}{\pi}} \approx 11.62 \text{ cm}$$

2. Find the area of a circle S.

$$\frac{360}{282} \cdot 20.89 = \frac{282}{360} \cdot A \cdot \frac{360}{282}$$

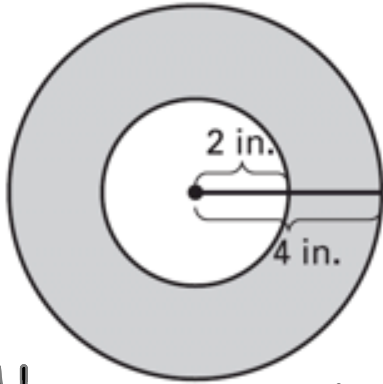
$$A = \frac{37602}{1410}$$

$$A = \frac{6267}{235} \approx 26.67 \text{ ft}^2$$



## Area of Shaded Regions

Find the area of the shaded region.



$$A_L = 4^2 \pi$$

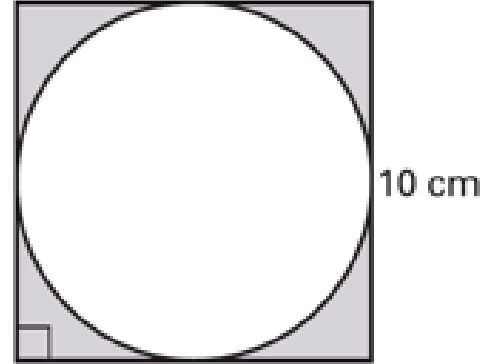
$$A_L = 16\pi$$

$$A_S = 2^2 \pi$$

$$A_S = 4\pi$$

$$16\pi - 4\pi = 12\pi$$

$$A = 37.7 \text{ in}^2$$

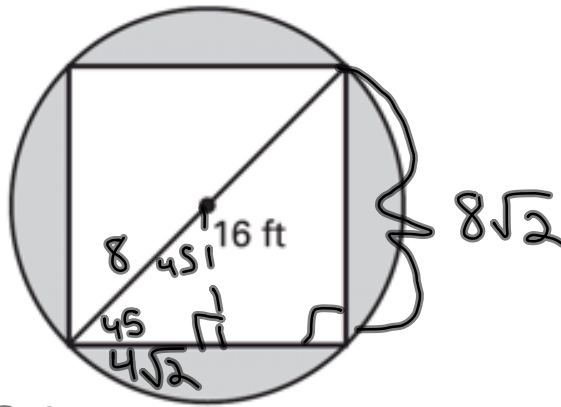


$$A_S = 10^2 = 100$$

$$A_C = 5^2 \pi = 25\pi$$

$$100 - 25\pi$$

$$A = 21.46 \text{ cm}^2$$



$$A_C = 8^2 \pi$$

$$A_C = 64\pi$$

$$A_S = (8\sqrt{2})^2 = 128$$

$$A = 64\pi - 128 \approx 73.06 \text{ ft}^2$$

## Homework Assignment

**Pg. 758-759**  
**#11-31**

