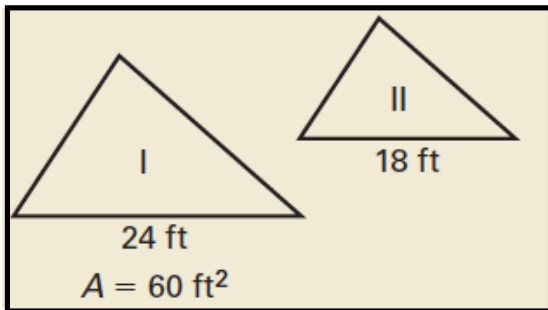


**Bellwork**  
**04/17/12**

1. Use Figure I~Figure II to find the ratio of the sides. Then find the unknown area.



$$24:18$$

$$RS \rightarrow 4:3 \quad RA \rightarrow 16:9$$

$$\frac{16}{9} = \frac{60}{x}$$

$$16x = 540$$

$$x = 33.75 \text{ ft}^2$$

## Geometry

### 11.4 Circumference and Arc Length

Standard(s): 4, 6

### Vocabulary:

**Arc Length:** A portion of the circumference of a circle.

*Note: the measure of the arc (in degrees) can be used to find the length (in units).*

**Circumference:** The distance around a circle.

*Note: We no longer use 3.14 as Pi. You will use the  $\pi$  button on your calculator.*

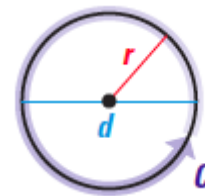
### THEOREM

*For Your Notebook*

#### THEOREM 11.8 Circumference of a Circle

The circumference  $C$  of a circle is  $C = \pi d$  or  $C = 2\pi r$ , where  $d$  is the diameter of the circle and  $r$  is the radius of the circle.

*Justification:* Ex. 2, p. 769



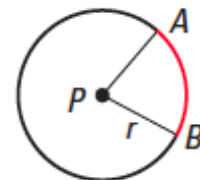
$$C = \pi d = 2\pi r$$

### COROLLARY

*For Your Notebook*

#### ARC LENGTH COROLLARY

In a circle, the ratio of the length of a given arc to the circumference is equal to the ratio of the measure of the arc to  $360^\circ$ .



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

## Find Indicated Measures

Find the indicated measure.

1. Circumference of a circle with radius 15 in.

$$C = 2r\pi$$

$$C = 2r\pi$$

$$C = 2(15)\pi$$

$$C = 30\pi$$

$$C = 94.2 \text{ in.}$$

2. Radius of a circle with circumference 36 ft.

$$C = 2r\pi$$

$$\frac{36}{2\pi} = \frac{2r\pi}{2\pi}$$

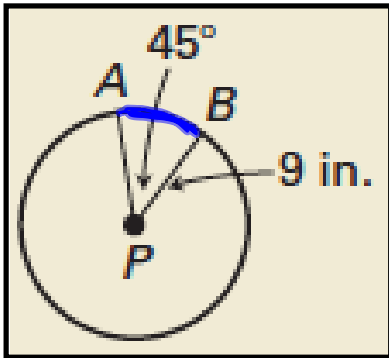
$$r = \frac{36}{2\pi}$$

$$r = \frac{18}{\pi}$$

$$r = 5.7 \text{ ft.}$$

## Find Arc Lengths

Find the length of arc  $\widehat{AB}$ .



$$C = 2r\pi$$

$$C = 2(9)\pi$$

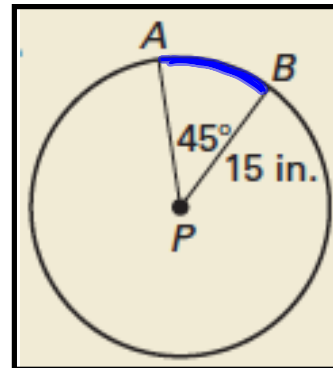
$$C = 18\pi$$

$$\widehat{AB} = \frac{45}{360} \cdot \frac{18\pi}{1}$$

$$\widehat{AB} = \frac{810\pi}{360}$$

$$\widehat{AB} = \frac{9\pi}{4} \text{ in.}$$

$$\widehat{AB} = 7.1 \text{ in.}$$



$$C = 2(15)\pi$$

$$C = 30\pi$$

$$\widehat{AB} = \frac{45}{360} \cdot \frac{30\pi}{1}$$

$$\widehat{AB} = \frac{1350\pi}{360}$$

$$\widehat{AB} = \frac{15\pi}{4}$$

$$\widehat{AB} = 11.8 \text{ in.}$$

## Use Central Angles

In circle D,  $\angle ADC \cong \angle BDC$ . Find the indicated measure.

$m\widehat{ACB}$

$$320^\circ$$

Length of  $\widehat{ACB}$

$$\widehat{ACB} = \frac{320}{360} \cdot \frac{8\pi}{1}$$

$$= 22.3$$

$m\widehat{CB}$

$$160^\circ$$

Length of  $\widehat{BAC}$

$$\widehat{BAC} = \frac{200}{360} \cdot \frac{8\pi}{1}$$

$$= \frac{40\pi}{9}$$

$$= 14 \text{ in}$$

$m\widehat{ABC}$

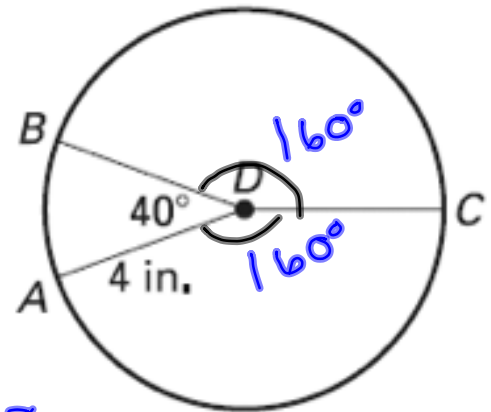
$$200^\circ$$

Length of  $\widehat{CB}$

$$\widehat{CB} = \frac{160}{360} \cdot \frac{8\pi}{1}$$

$$= \frac{32\pi}{9}$$

$$= 11.2 \text{ in.}$$



$$C = 2r\pi$$

$$C = 2(4)\pi$$

$$C = 8\pi$$

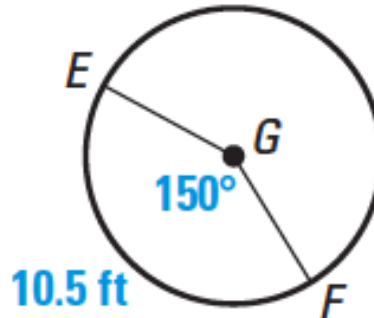
$$360 - 40 = 320$$

$$\frac{320}{2} = 160^\circ$$

## Use Arc Lengths

Find the indicated measure.

### Radius of circle G



$$5 = \frac{3}{4}r$$

$$\text{Length} = \frac{m^\circ}{360} \cdot 2\pi r$$

$$10.5 = \frac{150}{360} \cdot \frac{2\pi r}{1}$$

$$\frac{360}{300\pi} \cdot 10.5 = \frac{300\pi}{360} \cdot r \cdot \frac{360}{300\pi}$$

$$r = \frac{10.5}{1} \cdot \frac{360}{300\pi}$$

$$r = \frac{3780}{300\pi}$$

$$r = \frac{63}{5\pi}$$

$$r = 39.6 \text{ ft.}$$

## Homework Assignment

**Pg. 749-750**  
**#3-23, not #14**

