

Section 11.5 & 11.6 - Circumference

1. State the formula for the circumference of the circle. Write the formula in terms of the diameter and in terms of the radius.

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

2. Solve the following, leave all answers in terms of  $\pi$

- a. A circle has center (2,2) and contains the point (4,0). Find the circumference.

not diam.  $\rightarrow$  radius  $\sqrt{(4-2)^2 + (0-2)^2}$  (goes thru pt (4,0))

$$= \sqrt{4+4}$$

$$r = \sqrt{8} = 2\sqrt{2}$$

$$C = 2\pi r$$

$$= 2\pi(2\sqrt{2})$$

$$= 4\pi\sqrt{2}$$

- b. Find the diameter and radius of a circle with circumference 16.

$$C = \pi d$$

$$16 = \pi d$$

$$\frac{16}{\pi} = d$$

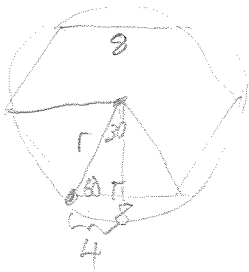
$$C = 2\pi r$$

$$16 = 2\pi r$$

$$\frac{16}{2\pi} = r$$

$$r = \frac{8}{\pi}$$

- c. Find the circumference of a circle that is circumscribed about a regular hexagon with side length 8.



$$C = 2\pi r$$

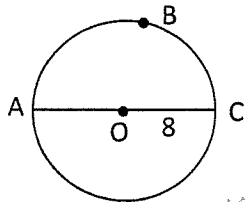
$$= 16\pi$$

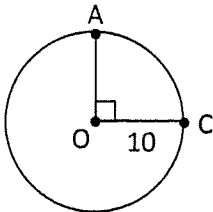
radius = 8

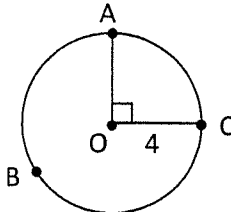
Same as measuring in inches, ft, m, not degrees.

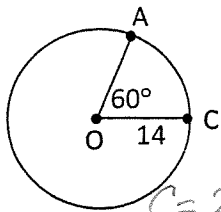
**Section 11.5 & 11.6 - Arc Length**

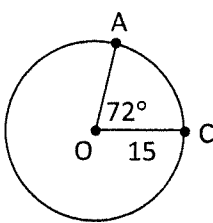
The length of an arc is a portion or fraction of the circumference of the circle. Try the following examples to generate a rule that would apply to finding the arc length of any circle.

1.   
 $C = 2\pi r = 2\pi \cdot 8 = 16\pi$   
 $\frac{1}{2} \cdot 16\pi = 8\pi$   
 Length of  $\widehat{ABC} = 8\pi$

2.   
 $C = 20\pi$   
 $\frac{1}{4} \cdot 20\pi = 5\pi$   
 Length of  $\widehat{AC} = 5\pi$

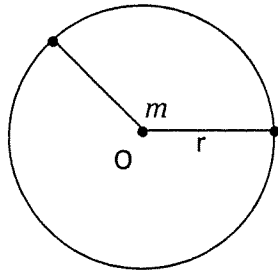
3.   
 $C = 8\pi$   
 $\frac{3}{4} \cdot 8\pi = 6\pi$   
 Length of  $\widehat{ABC} = 6\pi$

4.   
 $C = 28\pi$   
 $\frac{60}{360} = \frac{1}{6}$   
 $\frac{1}{6} \cdot 28\pi = \frac{14\pi}{3}$   
 Length of  $\widehat{AC} = \frac{14\pi}{3}$

5.   
 $C = 30\pi$   
 $\frac{72}{360} = \frac{1}{5}$   
 $\frac{1}{5} \cdot 30\pi = 6\pi$   
 Length of  $\widehat{AC} = 6\pi$

Use the diagram below to write a formula for find arc length.

m = measure of the central angle  
 r = radius of the circle



$$AL = \frac{m}{360} \cdot 2\pi r$$