

**Warm-Up:**

Explain HW over the break.

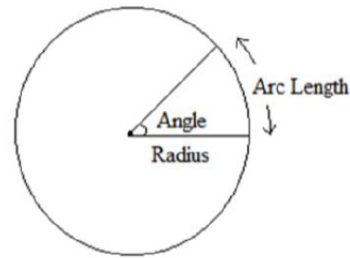
**What am I learning today?**

**Learning Objective 4B.1 (pg. 1-2)**

How to use the arc length formula.

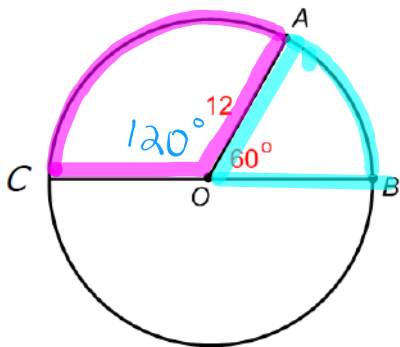
**Arc Length** – The physical length of a part of the outside of the circle or the circumference  
 \*\*\*Arc length DOES NOT equal arc measure!!\*\*\*

**Funny way to remember:**  
 Arc Length = Pie crust



**Formula:**

$$\frac{\text{(piece) Arc Length}}{\text{(whole) Circumference } (2\pi r)} = \frac{\text{Central Angle } (\theta) \text{ (piece)}}{\text{Whole Circle in degrees } (360^\circ) \text{ (whole)}}$$



1. Find the length of Arc AB.

$$\frac{60}{360} = \frac{x}{2\pi(12)} \quad x = 4\pi \text{ (in terms of pi)}$$

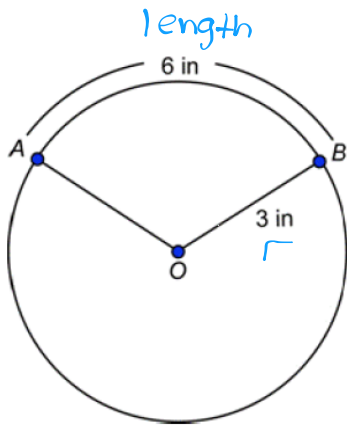
$$\frac{360x}{360} = \frac{1440\pi}{360} \approx 12.57$$

2. Find the length of Arc CA.

$$\frac{120}{360} = \frac{x}{2\pi(12)}$$

$$\frac{360x}{360} = \frac{2880\pi}{360}$$

$$x = 8\pi \approx 25.13$$



3. Find the measure of Angle AOB.

$$\frac{X}{360^\circ} = \frac{6}{2\pi(3)}$$

$$\frac{2160}{(6\pi)} = \frac{6\pi X}{6\pi}$$

$$114.59^\circ = X$$

4. A circle has an arc whose measure is  $60^\circ$  and whose length is  $44\pi$ .  
What is the diameter of the circle?

find  $2(\text{radius})$

↑  
angle

↑  
arc  
length

$$\frac{60^\circ}{360^\circ} = \frac{44\pi}{2\pi r}$$

$$d = 2(132)$$

$$= 264$$

$$\frac{15840\pi}{120\pi} = \frac{120\pi r}{120\pi}$$

$$(15840\pi) / (120\pi) = r$$

$$132 = r$$

# 1 - zArc Length.notebook

1. A circle has an arc whose measure is  $80^\circ$  and whose length is  $88\pi$ . What is the diameter of the circle?

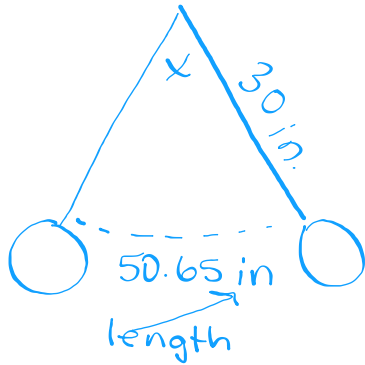
$$\frac{80^\circ}{360^\circ} = \frac{88\pi}{2\pi r}$$
$$\frac{31680\pi}{160\pi} = \frac{160\pi r}{160\pi}$$
$$198 = r$$

$$d = 2(198)$$
$$= 396$$

2. Find the measure of the central angle of a circle if its minor arc length is  $14\pi$  and the radius is 18 inches.

$$\frac{x}{360^\circ} = \frac{14\pi}{2\pi(18)}$$
$$\frac{5040\pi}{36\pi} = \frac{36\pi x}{36\pi}$$
$$140^\circ = x$$

3. A pendulum is 30 inches long. When the pendulum swings it travels along the arc of a circle and covers a distance 50.65 inches. What is the angle that the pendulum is swinging?

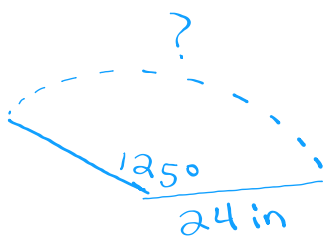


$$\frac{x}{360^\circ} = \frac{50.65}{2\pi(30)}$$

$$\frac{18234}{60\pi} = \frac{60\pi x}{60\pi}$$

$$96.73^\circ = x$$

4. A windshield wiper is 24 inches long. In one sweep, it goes through an angle of  $125^\circ$ . What is the distance that the windshield wiper covers?

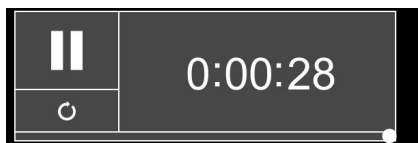


$$\frac{125^\circ}{360^\circ} = \frac{x}{2\pi(24)}$$

$$\frac{360x}{360} = \frac{6000\pi}{360}$$

$$x = 52.36 \text{ in.}$$

**Classwork:**



Complete the classwork about arc length.

**HW:** Finish the HW paper.