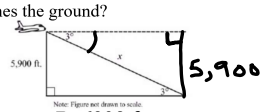
**Arc Length**

Pg. 35

An airplane is at an altitude of 5900 feet. The airplane descends at an angle of 3°. About how far will the airplane travel in the air until reaches the ground?

$\sin 3^\circ = 0.0523$
$\cos 3^\circ = 0.9986$
$\tan 3^\circ = 0.0524$

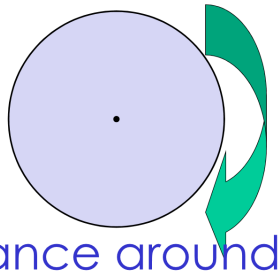



A. 5908 ft. B. 6238 ft.
C. 102,578 ft. D. 112,733 ft.

$\sin(3) = \frac{5900}{x}$

$x = \frac{5,900}{\sin(3)}$

# Circumference



Distance around the circle

# Circumference

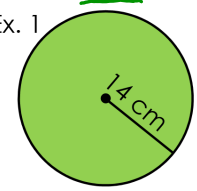
$$C = \pi d$$

OR

$$C = 2\pi r$$

Find the circumference in terms of pi and to the nearest tenth

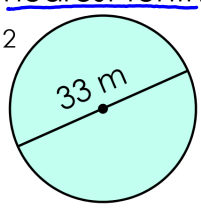
Ex. 1




$2\pi(14)$

$28\pi \approx 88.0$

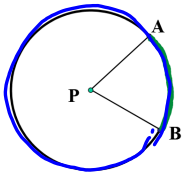
Ex. 2




$33\pi \approx 103.7$

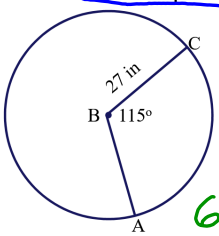
# Arc Length

Portion of the circumference




$$arc\ length = \frac{2\pi r\theta}{360}$$

Ex. 3 Find the arc length of $\overset{\frown}{CA}$. In terms of $\pi$ and rounded to the tenths place.



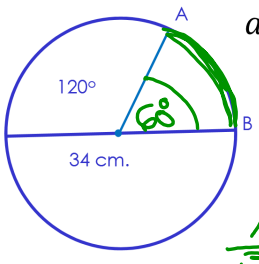

$$arc\ length = \frac{2\pi r\theta}{360}$$

$\frac{2\pi(27)(115)}{360^\circ}$

$\frac{69}{4}\pi \approx 54.2$

**Arc Length**

Ex. 4 Find the length of $\overset{\frown}{AB}$. Leave answer in terms of $\pi$ and rounded to the nearest hundredth.

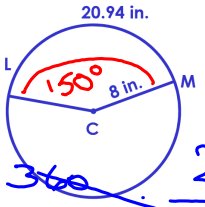



$$arc\ length = \frac{2\pi r\theta}{360}$$

$$\frac{2\pi(17)(60)}{360}$$

$$\frac{17}{3}\pi \approx 17.8\text{cm}$$

Ex 5: Find the m $\overset{\frown}{LM}$ given the arc length of $\overset{\frown}{LM}$. Round answer to the nearest degree.



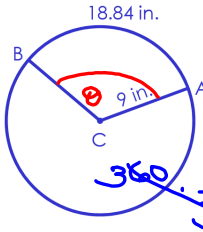

$$arc\ length = \frac{2\pi r\theta}{360}$$

$$\frac{360}{1} \cdot \frac{2\pi(8)(\theta)}{360} = \frac{20.94}{1}$$

$$2\pi(8)(\theta) = 7538.4$$

$$\frac{16\pi(\theta)}{16\pi} = \frac{7538.4}{16\pi}$$

Your Turn: Find the m $\overset{\frown}{AB}$.
Round your answer to the nearest degree.




$$\frac{2\pi(9)\theta}{360} = \frac{18.84}{1}$$

$$\frac{360}{1} \cdot \frac{18\pi\theta}{360} = \frac{18.84}{1} \cdot 360$$

$$\frac{\theta 18\pi}{18\pi} = \frac{6782.4}{18\pi} \rightarrow 120^\circ$$