

Practice:

Perform the following conversions.

1. Convert 160° to radians.

$$\frac{160^\circ \pi}{180} = \frac{8\pi}{9}$$

2. Convert $\frac{11\pi}{6}$ radians to degrees.

$$\frac{11\pi (180)}{6\pi} = 330^\circ$$

What is the length of an arc with a measure of 60° in a circle with a 10-centimeter radius?

$$\frac{x}{20\pi} = \frac{60}{360}$$
$$\frac{x}{20\pi} = \frac{1}{6}$$
$$\frac{x}{20\pi} = \frac{10}{20\pi} = \frac{x}{20}$$
$$\frac{10\pi}{3}$$

Your turn:

Convert 315° to radians.

$$\frac{7 \cancel{63} 315^\circ}{4 \cancel{36} 180} = \frac{7\pi}{4}$$

Convert $\frac{5\pi}{4}$ to degrees.

$$\frac{5\pi}{4} \left(\frac{180}{\pi} \right) = 225^\circ$$

An arc with a measure of 120° has an arc length of 10π inches.
What is the radius of the circle on which the arc sits?

$$\frac{10\pi}{d} = \frac{120}{360}$$
$$\frac{10}{d} = \frac{1}{3}$$
$$30 = d$$
$$r = 15$$

An arc has a length of 4π units and a radius of 6 units. What is the angle of the sector in radians?

$$\frac{4\pi}{3 \cdot 2\pi} = \frac{x}{360}$$

$$\frac{1}{3} \cdot \frac{x}{360}$$

$$\frac{3x}{3} = \frac{360}{3}$$

$$\boxed{\frac{2\pi}{3}}$$

$$x = 120 \left(\frac{\pi}{180} \right)$$

$$\frac{6 \cdot 120\pi}{3 \cdot 180}$$

Suppose a circle with an 11.4 inch arc intercepted by the central angle and a radius that is 3 inches long. Determine the measure of the central angle in radians.