

Angles + Radian Measure

Degrees to Radians

radians are a "unitless" measure

$$300^\circ \cdot \frac{\pi \text{ radians}}{180 \text{ degrees}} = \frac{300\pi}{180} = \frac{\cancel{6}}{\cancel{6}} = \frac{5\pi}{3} \leftarrow \text{final answer}$$

↑ divide by 10

$$\frac{5\pi}{3} \cdot \frac{180}{\pi} = \frac{900}{3} = 300^\circ$$

Convert:

$$\frac{4\pi}{3} \cdot \frac{180}{\pi} = \frac{720}{3} = 240^\circ$$

$$225^\circ \cdot \frac{\pi}{180} = \frac{225\pi}{180} = \frac{5\pi}{4}$$

$$\frac{25\pi}{20} = \frac{5}{4} = \frac{5\pi}{4}$$

Radian measure can be used to find the length of a circular arc. A circular arc is a part of a circle.

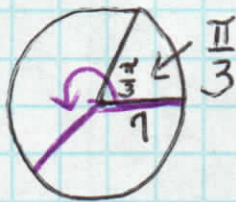
$$\frac{s}{\theta} = r$$

s = arc length

θ = central angle \leftarrow must be in radians

r = radius

Example 1



$$\theta = \frac{5\pi}{4}$$

$$\frac{s}{\theta} = r \quad \frac{s}{\frac{\pi}{3}} = 7 \cdot \frac{\pi}{3}$$

$$s = \frac{7\pi}{3} \approx \boxed{7.33 \text{ units}}$$

$$\frac{5\pi}{4} \cdot \frac{s}{\frac{5\pi}{4}} = 7 \cdot \frac{5\pi}{4}$$

$$s = \frac{35\pi}{4} \approx 27.489$$