

Radians Recap

$$(3.14) \pi \text{ radians} = 180^\circ$$

$$1 \text{ radian} = 57.3^\circ$$

$$\frac{3\pi}{4} \quad 2 \text{ radians}$$

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

$$s = r\theta$$

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

$\theta = \text{MUST}$
be in Radians

Example 1

Given radius = 8 and $\theta = \frac{2\pi}{3}$, find the length of the arc subtended by $\frac{2\pi}{3}$, this angle

$$r = 8$$

$$\theta = \frac{2\pi}{3} \leftarrow \text{in radians}$$

$$s = 8 \cdot \frac{2\pi}{3} = \frac{16\pi}{3} \leftarrow \text{EXACT}$$

$$\approx 16.76$$

Example 2

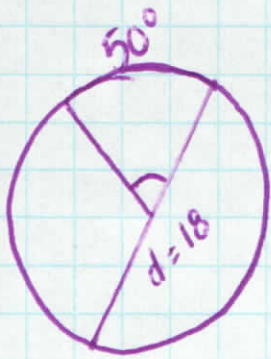
Given $\theta = 2.4$ radians and the length of the arc is 5.8 units, find the radius.

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

$$r = \frac{5.8}{2.4} = r \approx 2.42$$

Find Arc Length

Example 3



$$r = 9$$

$$\theta = \frac{5\pi}{18}$$

$$\frac{50}{1} \cdot \frac{\pi}{180} = \frac{50\pi}{180} = \frac{5\pi}{18}$$

$$S = \frac{9 \left(\frac{5\pi}{18} \right)}{1} = \frac{45\pi}{18} = \frac{5\pi}{2}$$

$$= 7.85$$

Example 4

Use the arc length formula to find the radius of a given circle given a central angle of 120° , that subtends the arc-length, $s = 2$

$$\frac{120}{180} \cdot \frac{\pi}{180} = \frac{120\pi}{180} = \frac{2\pi}{3} = \theta$$

$$s = 2$$

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

$$\frac{2}{\left(\frac{2\pi}{3} \right)}$$

$$s = .95$$

Example 5

On a circle of radius 9 feet, what angle would subtend an arc of 4 feet

$$r = 9$$

$$s = 4$$

$$\theta = ?$$

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

$$\theta = \frac{4}{9}$$

$$\text{radians} = .444$$

degrees times by
 $\frac{180}{\pi}$