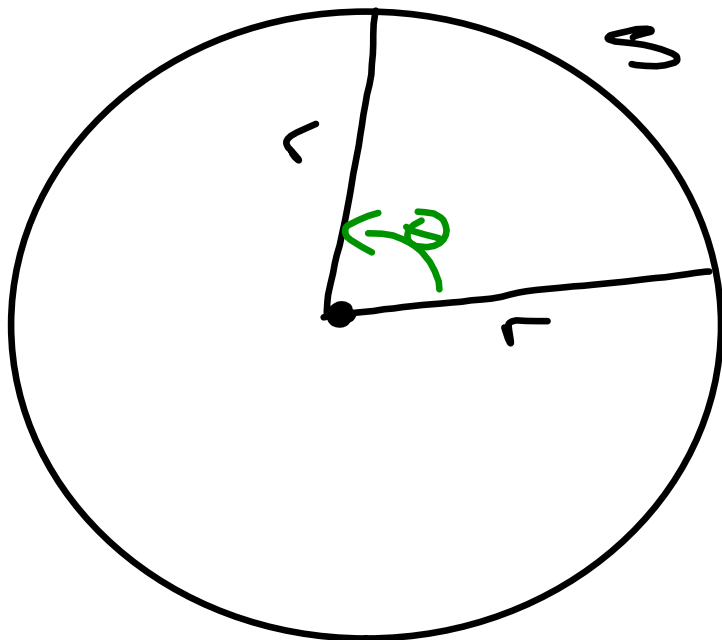


Feb. 14, 2014

Sect. 2-1b

Arc Length and  
Area of a Circle Sector  
"Pie Piece"

Radian Measure



If  $s = r$

then

$m\angle\theta = 1$  radian

$$s = r\theta$$

(if  $\theta$  is in radians)

Find the arc length

if  $\theta = 2$   
and  $r = 3\text{cm}$

$$s = r\theta$$

$$s = 3(2)$$

$$s = 6\text{cm}$$

if  $\theta = 30^\circ$   
and  $r = 3\text{cm}$

~~$$s = 3(30)$$~~ No

$$s = 30 \left( \frac{2\pi}{360} \right) 3$$

$$s = \frac{\pi}{6} (3)$$

$$= \frac{\pi}{2} \text{cm}$$

Find  $\theta$  in radians if

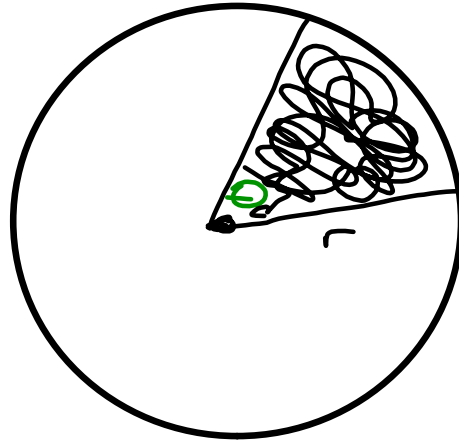
$$s = 12 \text{ m and } r = 4 \text{ m}$$

$$s = r\theta$$

$$12 = 4\theta$$

$$\theta = 3 \text{ radians}$$

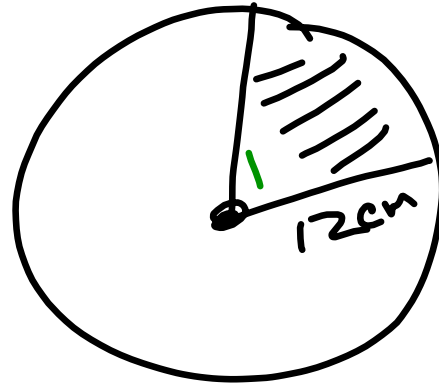
## Circle Sector Area



$$\frac{A}{\pi r^2} = \frac{\theta}{2\pi}$$

$$2\cancel{\pi} A = \cancel{\pi} r^2 \theta$$

$$A = \frac{1}{2} r^2 \theta$$



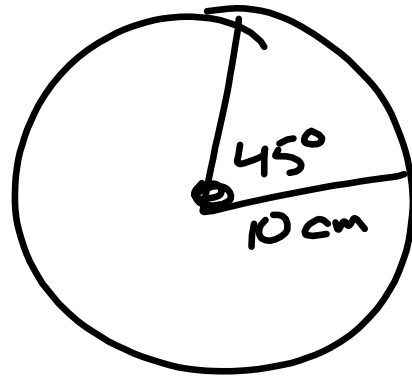
$$m\angle\theta = 1$$

$$r = 12 \text{ cm}$$

$$\frac{A}{\pi(12)^2} = \frac{1}{2\pi}$$

$$\cancel{2A\pi} = 144\cancel{\pi}$$

$$A = 72 \text{ cm}^2$$



$$m\angle\theta = 45^\circ$$

$$r = 10 \text{ cm}$$

$$A = \frac{1}{2} r^2 \theta$$

$$A = \left(\frac{2\pi}{360}\right)(45)(10)^2 \left(\frac{1}{2}\right)$$

$$A = \frac{100\pi}{8} (100)$$

$$A = \frac{100\pi}{8} \text{ cm}^2$$