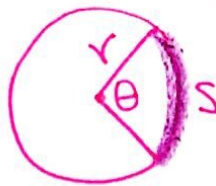


6.5: Arc length & Area of a Sector

° circumference: $C = 2\pi r$



° arc length: $s = \frac{\theta}{360} \cdot 2\pi r$



θ = "theta"
central angle
 r = radius
 s = arc length

Find arc length:

Ex 1)



$$s = \frac{\theta}{360} \cdot 2\pi r$$

$$s = \frac{242}{360} \cdot 2\pi \cdot 3$$

$$s = 12.67 \text{ ft}$$

Ex 2) radius of 7 cm & central angle of 50°

$$s = \frac{\theta}{360} \cdot 2\pi r$$

$$s = \frac{50}{360} \cdot 2\pi \cdot 7$$

$$s = 6.11 \text{ cm}$$

Ex 3) $s = 15 \text{ ft}$, $r = 7 \text{ ft}$. find θ .

$$s = \frac{\theta}{360} \cdot 2\pi r$$

$$360 \cdot 15 = \left(\frac{\theta}{360} \cdot 2\pi \cdot 7 \right) 360$$

$$5400 = \theta \cdot 2\pi \cdot 7$$

$$\frac{5400}{43.98} = \frac{\theta \cdot 43.98}{43.98}$$

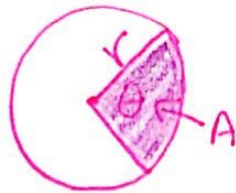
$$\theta = 122.78^\circ$$

Area: $A = \pi r^2$



Area of a sector

$$A = \frac{\theta}{360} \cdot \pi r^2$$



Find area of a sector:

Ex 4)



$$A = \frac{\theta}{360} \cdot \pi r^2$$

$$A = \frac{75}{360} \cdot \pi 2^2$$

$$A = 2.62 \text{ in}^2$$

Ex 5) radius = 4 in, central angle = 225°

$$A = \frac{\theta}{360} \cdot \pi r^2$$

$$A = \frac{225}{360} \cdot \pi 4^2$$

$$A = 31.42 \text{ in}^2$$

Ex 6) $A = 23 \text{ cm}^2$, $\theta = 38^\circ$, find r.

$$A = \frac{\theta}{360} \cdot \pi r^2$$

$$23 = \frac{38}{360} \pi r^2$$

$$23 = \frac{38}{360} r^2$$

$$\sqrt{69.33} = \sqrt{r^2}$$

$$r = 8.33 \text{ cm}$$