

## 4.2 | Degrees and Radians (day 2)

### **CIRCULAR** *Motion*

$$\text{Linear Velocity: } v = \frac{s}{t} \quad \text{or} \quad V = r\omega$$

**WHY?**

$$\text{Angular Velocity: } \omega = \frac{\theta}{t}$$

(angle must be in radians)

$$\text{one rev/min} = 2\pi \text{ radians/min}$$

Ex. 1

**Given:**  $r = 2$  ft. and  $\omega = 180$  rev/min, find the linear Velocity in ft./min.

$$V = r\omega$$

$$V = 2 \text{ ft.} (180) \left( \frac{2\pi}{\text{min}} \right)$$

$$V = 720\pi$$

$$V \approx 2262 \text{ ft / min}$$

**Ex. 2**

**Given:**  $r = 5 \text{ ft.}$  and  $V = 60 \text{ mi/hr}$ , find  $\omega$  in rad/sec.

$$V = r\omega$$

$$\frac{60 \text{ mi}}{\text{hr}} \bullet \frac{1 \text{ hr}}{3600 \text{ sec}} \bullet \frac{5280 \text{ ft}}{1 \text{ mi}} = 5 \text{ ft} \bullet \omega$$

$$\frac{88 \text{ ft}}{\text{sec}} = 5 \text{ ft} \bullet \omega \quad (\text{divide by } 5 \text{ ft.})$$

$$17.6 \text{ rad / sec} = \omega$$

## W.S. 4.2 Practice

Problem #1

Problem #4

Problem #7

# Assignment:

W.S. 4.2