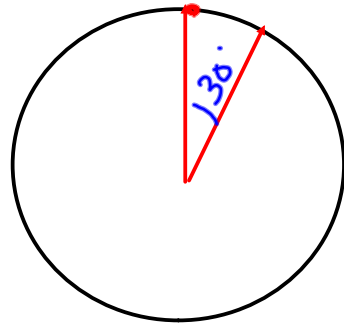


College text handout:

P. 218 # 2

2. A wheel has a radius of 4.1m. How far does a point on the circumference travel if the wheel is rotated through: 30 rad, and 30 rev, respectively?



Find length of point travel as it "rolls out"

$30^\circ = \frac{1}{12}$  of circumference

$$\begin{aligned} \text{Circ} &= 2\pi r \\ &= 2\pi(4.1\text{m}) \\ &= 25.8\text{m} \end{aligned}$$

$$\begin{aligned} \frac{30^\circ}{360^\circ} \times \text{Circ} \\ = \frac{1}{12} (25.8\text{m}) = 2.15\text{m} \end{aligned}$$

30 RAD

$$\begin{array}{c|c|c} 30 \text{ RAD} & 1 \text{ circ} & 25.8\text{m} \\ \hline & 2\pi \text{ rad} & 1 \text{ circ} \\ \hline \end{array}$$

$$\frac{(30)(25.8)}{(2\pi)} = 123.2\text{m}$$

30  $\boxed{\div}$   $\boxed{(}$  2  $\boxed{\times}$   $\boxed{\pi}$   $\boxed{)}$   
 $\boxed{\text{enter}}$   $\boxed{\times}$  25.8  $\boxed{\text{enter}}$

30 Rev:

$$30 \text{ rev} \left( \frac{25.8\text{m}}{\text{rev}} \right) = 774\text{m}$$

P. 218 #4

$$V_i = 0 \frac{\text{rev}}{\text{s}} = 0 \frac{\text{rad}}{\text{s}} = \omega_i$$

$$V_f = .20 \frac{\text{rev}}{\text{s}} \left( \frac{2\pi \text{rad}}{\text{rev}} \right) = .4\pi \frac{\text{rad}}{\text{s}} = \omega_f$$

$$t = 30 \text{ s}$$

$$\alpha = ? \frac{\text{rad}}{\text{s}^2}$$

$$\begin{aligned} \alpha &= \frac{\Delta \omega}{\Delta t} \\ \alpha &= \frac{(.4\pi - 0) \frac{\text{rad}}{\text{s}}}{30 \text{ s}} \\ &= .042 \frac{\text{rad}}{\text{s}^2} \end{aligned}$$