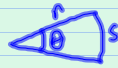


Ch 7 $\theta = \frac{s}{r}$ angle arc length radius



$\pi \text{ rad} = 180^\circ = .5 \text{ rev}$

linear
 $v = \frac{d}{t}$

circular
 $\omega = \frac{\theta}{t}$

base
 $\frac{\text{rad}}{\text{s}}$ degree $\frac{\text{rev}}{\text{s}}$

(omega)
circular speed/vel

$a = \frac{v}{t}$

$\alpha = \frac{\omega}{t}$

$\frac{\text{rad}}{\text{s}^2}$

alpha
circular acceleration

circ diam = π
3.14

$180^\circ \text{ degrees} = \pi \text{ rad} = .5 \text{ rev}$

1. $\frac{437^\circ}{180} \cdot \pi \text{ rad} = 7.45 \text{ rad}$

2. $\frac{2.5 \text{ rev}}{.5 \text{ rev}} \cdot \pi \text{ rad} = 15.7 \text{ rad}$

3. $\frac{4 \text{ rad}}{\pi \text{ rad}} \cdot 180^\circ = 240^\circ$

4. $\frac{43.4 \text{ rad}}{\pi \text{ rad}} \cdot .5 \text{ rev} = 6.9 \text{ rev}$

5. $\frac{325 \text{ rev}}{\text{min}} \cdot \frac{\pi \text{ rad}}{.5 \text{ rev}} \cdot \frac{1 \text{ min}}{60 \text{ s}} = 34 \frac{\text{rad}}{\text{s}}$

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

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$\alpha = 3.5 \frac{\text{rad}}{\text{s}^2}$

a) $\omega_i = 2 \frac{\text{rad}}{\text{s}} \quad t_i = 0$

$\theta = ? \quad t = 0 \rightarrow t = 2 \text{ s}, \Delta t = 2 \text{ s} \rightarrow v_f = v_i + at$

$\theta = \omega_i t + \frac{1}{2} \alpha t^2$
 $= 2(2) + \frac{1}{2}(3.5)(2)^2$

$\theta = 11 \text{ rad}$

b) $\omega_f = ? \quad @ 2 \text{ s}$

$\omega_f = \omega_i + \alpha t$
 $= 2 + 3.5(2)$
 $= 9 \frac{\text{rad}}{\text{s}}$

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

ans.

1) $3.168 \times 10^8 \text{ rad}$
 $5.04 \times 10^7 \text{ rev}$

- 2) a) 2.13 m
b) 123 m
c) 773 m

convert $\theta \rightarrow \text{rad}$ then use $s = \theta \cdot r$

θ -
 s - arc length
 r - radius
 ω - ang. vel/speed rad/s
 α - ang. acc rad/s²

$v_f = v_i + at$
 $d = v_i t + \frac{1}{2} at^2$
 $v_f^2 = v_i^2 + 2ad$
 $\omega_f = \omega_i + \alpha t$
 $\theta = \omega_i t + \frac{1}{2} \alpha t^2$
 $\omega_f^2 = \omega_i^2 + 2\alpha \theta$

Circular angular rotational
 $d = 2r$
 $\text{circ} = 2r\pi = d\pi$
 $\text{area} = \pi r^2$
 $s = 60,000 \text{ mi}$
 $d = 2ft$
 $r = 1ft$
1 circ