

PROB. 15-29

$$\omega_0 = 0, \Delta y_A = 16 \text{ ft}, t = 5 \text{ s}$$

UNIFORMLY ACCELERATED MOTION

a) FIND  $\alpha$

$$s = r\theta, \theta - \theta_0 = \frac{s}{r} = \frac{(16 \text{ ft})}{(0.75 \text{ ft})} = 21.33 \text{ RAD}$$

$$\theta = \theta_0 + \omega_0 t + \frac{1}{2} \alpha t^2$$

$$\alpha = \frac{2}{t^2} [(\theta - \theta_0) - \omega_0 t]$$

$$\alpha = \frac{2}{(5 \text{ s})^2} \cdot (21.33 \text{ RAD}) = \boxed{1.707 \frac{\text{RAD}}{\text{s}^2}}$$

b) FIND  $\omega$  AT  $t = 4 \text{ s}$

$$\omega = \omega_0 + \alpha t = (1.707 \frac{\text{RAD}}{\text{s}^2})(4 \text{ s}) = \boxed{6.827 \frac{\text{RAD}}{\text{s}}}$$