

PROB. 15-18

$\omega_0 = 0$, $r = 0.2^m$, $\alpha = 0.3 \frac{\text{RAD}}{\text{s}^2}$, FIND a_B FOR
 $t = 0, 2, 4^s$

$$a_t = r\alpha, \quad a_n = r\omega^2$$

FOR UNIFORMLY ACCELERATED MOTION,

$$\omega = \omega_0 + \alpha t = \alpha t$$

$$a_n = r(\alpha t)^2$$

$$\text{AT } t = 0, \quad a_n = 0, \quad a_t = (0.2^m) \left(0.3 \frac{\text{RAD}}{\text{s}^2} \right) = 0.06 \frac{\text{m}}{\text{s}^2}$$

$$a = \sqrt{0^2 + 0.06^2} = 0.06 \frac{\text{m}}{\text{s}^2}$$

$$\text{AT } t = 2^s, \quad a_n = (0.2^m) \left[\left(0.3 \frac{\text{RAD}}{\text{s}^2} \right) (2^s) \right]^2 = 0.072 \frac{\text{m}}{\text{s}^2}$$

$$a_t = (0.2^m) \left(0.3 \frac{\text{RAD}}{\text{s}^2} \right) = 0.06 \frac{\text{m}}{\text{s}^2}$$

$$a = \sqrt{0.06^2 + 0.072^2} = 0.09372 \frac{\text{m}}{\text{s}^2}$$

$$\text{AT } t = 4^s, \quad a_n = (0.2^m) \left[\left(0.3 \frac{\text{RAD}}{\text{s}^2} \right) (4^s) \right]^2 = 0.288 \frac{\text{m}}{\text{s}^2}$$

$$a_t = 0.06 \frac{\text{m}}{\text{s}^2}$$

$$a = \sqrt{(0.06)^2 + (0.288)^2} = 0.2942 \frac{\text{m}}{\text{s}^2}$$