

84. (a) Using Eq. 11-15 with  $\omega = 0$ , we have

$$\theta = \frac{\omega_0 + \omega}{2} t = 2.8 \text{ rad} .$$

- (b) One ingredient in this calculation is  $\alpha = (0 - 3.5 \text{ rad/s}) / (1.6 \text{ s}) = -2.2 \text{ rad/s}^2$ , so that the tangential acceleration is  $r\alpha = 0.33 \text{ m/s}^2$ . Another ingredient is  $\omega = \omega_0 + \alpha t = 1.3 \text{ rad/s}$  for  $t = 1.0 \text{ s}$ , so that the radial (centripetal) acceleration is  $\omega^2 r = 0.26 \text{ m/s}^2$ . Thus, the magnitude of the acceleration is

$$|\vec{a}| = \sqrt{0.33^2 + 0.26^2} = 0.42 \text{ m/s}^2 .$$