

Exercise 9-23

$$v = \omega r \quad \therefore \omega = \frac{v}{r} = \frac{5.50 \text{ m/s}}{0.260 \text{ m}} = 21.15 \text{ rad/s}$$

$$\omega = \omega_0 + \alpha t \quad \therefore \alpha = \frac{\omega - \omega_0}{t} = \frac{(21.15 - 0) \text{ rad/s}}{0.150 \text{ s}} = 141.0 \text{ rad/s}^2$$

$$\tau_{NET} = I\alpha$$

$$\therefore T(0.024 \text{ m}) = (0.0700 \text{ kg}\cdot\text{m}^2)(141.0 \text{ rad/s}^2)$$

$$\therefore T = 411 \text{ N}$$