

40. (a) The rotational inertia is $I = \frac{1}{2}MR^2 = \frac{1}{2}(3.00 \text{ kg})(0.700 \text{ m})^2 = 0.735 \text{ kg}\cdot\text{m}^2$.
(b) Using Eq. 16-22 (in absolute value), we find

$$\kappa = \frac{\tau}{\theta} = \frac{0.0600 \text{ N}\cdot\text{m}}{2.5 \text{ rad}} = 0.024 \text{ N}\cdot\text{m} .$$

- (c) Using Eq. 16-5, Eq. 16-23 leads to

$$\omega = \sqrt{\frac{\kappa}{I}} = \sqrt{\frac{0.024 \text{ N}\cdot\text{m}}{0.735 \text{ kg}\cdot\text{m}^2}} 0.181 \text{ rad/s} .$$