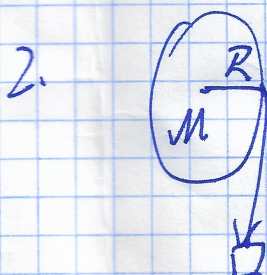


$$\frac{1}{2} I \left( \frac{v}{L} \right)^2 = m g L$$

$$\frac{1}{2} \times \frac{1}{3} m L^2 \times \frac{v^2}{L^2} = m g L$$

$$v = \sqrt{6 g L}$$

$$v \approx 4.9 \text{ m/s}$$



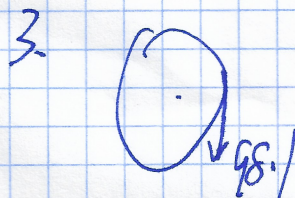
$$\textcircled{1} \quad m g - T = m a$$

$$\left\{ \begin{array}{l} T \cdot R = \frac{1}{2} m R a \\ a = g R \end{array} \right. \Rightarrow$$

$$a = g R$$

$$\textcircled{1}, \textcircled{2}: a = \frac{m g}{m + \frac{m}{2}}$$

$$\approx 3.1 \text{ m/s}^2$$



$$J_{\text{final}} = (J_F - J_f)$$

$$J_{\text{final}} = \frac{1}{2} m R^2 \omega$$

$$J_{F_{\text{int}}} =$$

$$J_F = F \cdot R$$

$$m = \frac{2 (J_F - J_f)}{R^2 \cdot \omega}$$

$$= \frac{2 (19.62 - 4.9)}{0.04 \times 100}$$

$$\omega = 7.3629$$