58. (a) We apply Eq. 10-34:

$$K = \frac{1}{2} I\omega^2 = \frac{1}{2}\left(\frac{1}{3}mL^2\right)\omega^2 = \frac{1}{6}mL^2\omega^2 = \frac{1}{6}(0.42\text{ kg})(0.75\text{ m})^2(4.0\text{ rad/s})^2 = 0.63\text{ J}.$$

(b) Simple conservation of mechanical energy leads to $K = mgh$. Consequently, the center of mass rises by

$$h = \frac{K}{mg} = \frac{mL^2\omega^2}{6mg} = \frac{L^2\omega^2}{6g} = \frac{(0.75\text{ m})^2(4.0\text{ rad/s})^2}{6(9.8\text{ m/s}^2)} = 0.153\text{ m} \approx 0.15\text{ m}.$$