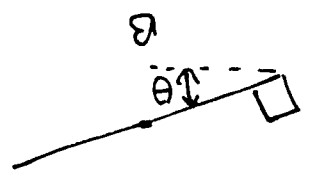
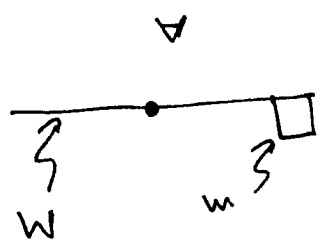


Problem 3



$$F_A = E_B$$

$$0 = -Mg \frac{l}{2} \sin \theta + \frac{1}{2} I_{tot} \omega_B^2$$

$$I_{tot} = \frac{1}{12} M l^2 + m \left(\frac{l}{2} \right)^2 = \frac{1}{12} M l^2 + \frac{1}{4} m l^2$$

$$= \frac{1}{4} \left(m + \frac{3}{4} M \right) l^2$$

$$0 = Mg \frac{l}{2} \sin \theta + \frac{1}{4} \cdot \frac{1}{4} \left(m + \frac{3}{4} M \right) l^2 \omega_B^2$$

$$\omega_B^2 = \frac{4Mg \sin \theta}{\left(m + \frac{3}{4} M \right) l}$$

$$\omega_B = 5.7 \text{ rad/s}$$