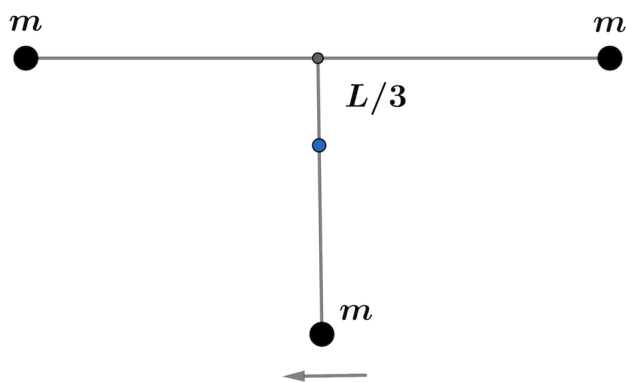


2018A F=ma Exam: Problem 14

Kevin S. Huang



Recall the angular frequency of a physical pendulum is given by

$$\omega = \sqrt{\frac{Mgd}{I}}$$

where d is the distance between the center of mass and pivot and I is the moment of inertia about the pivot. We have

$$d = L/3$$

Rotating in the plane:

$$I_1 = 3mL^2$$

Rotating out of the plane:

$$I_2 = mL^2$$

Thus,

$$\frac{T_1}{T_2} = \frac{\omega_2}{\omega_1} = \sqrt{\frac{I_1}{I_2}} = \sqrt{3}$$