1. (4 points) Define (*a*) work of a force on a body, (*b*) work of a moment on a body.
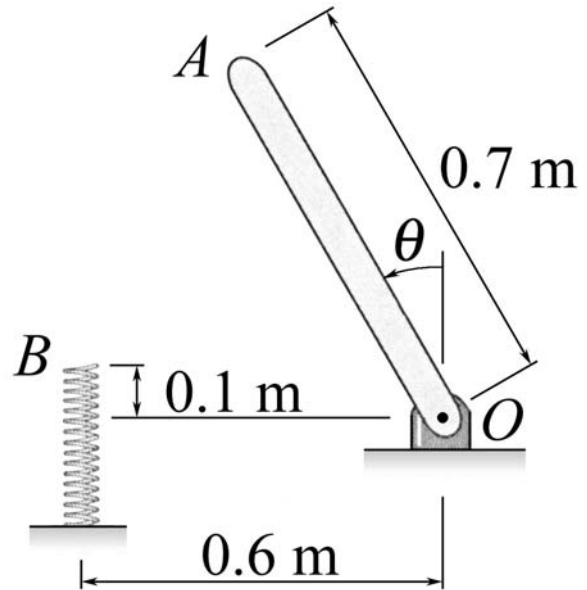
2. (6 points) The 10-kg rod shown is given a counter-clockwise angular velocity of ω in the position where $\theta = 0$. If the spring has a modulus of $k = 10$ kN/m and the rod is stopped by the spring just when it becomes horizontal, determine the value of ω.

---

1. (*a*) Work of a force on a body is equal to the force acting on the body times the displacement of the body in the direction of the force. (*b*) Work of a moment on a body is equal to the moment acting on the body times the angular displacement of the body in the direction of the moment.

2.
$$T_1 + V_1 = T_2 + V_2$$

$$\frac{1}{2}\left[\frac{1}{12}(10)(0.7)^2 + 10(0.35)^2\right]\omega^2 + 10(9.81)(0.35)$$

$$= 0 + \frac{1}{2}(10\,000)(0.1)^2$$

$$\omega = 4.3797 \qquad \boldsymbol{\omega = 4.38 \text{ rad/s}} \circlearrowleft$$