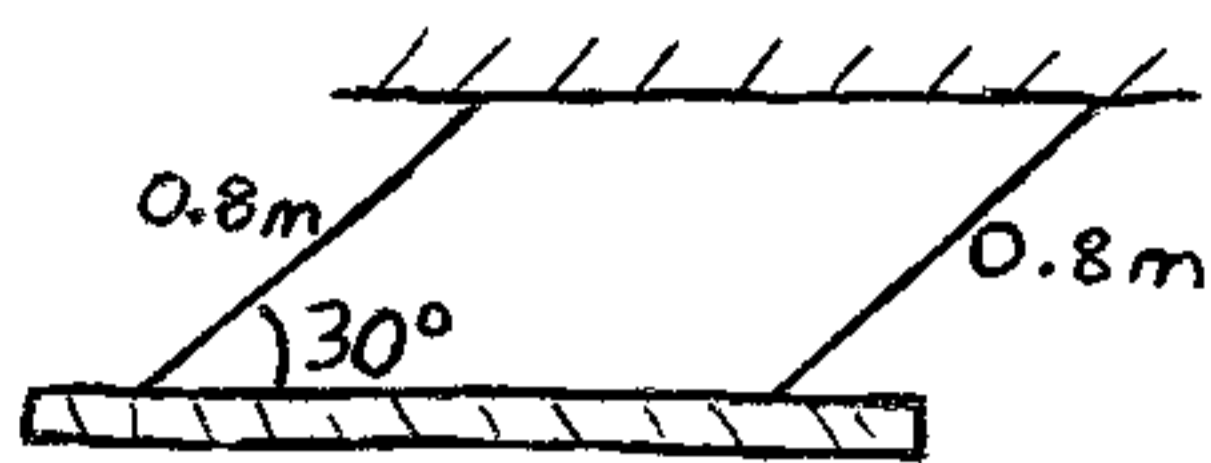


This is a problem involving conservation of energy.



A board of mass 16 kg is suspended from two cables, each of length 0.8 m, and each making an angle of 30° with the horizontal. While in this position, the board is released from rest. What is the velocity of the board when it is at its lowest position? Ignore the mass of the cables.

Solution:

Put the datum at the initial location of the board.

Apply the conservation of energy:

$$T_1 + V_1 = T_2 + V_2 \quad (1)$$

Substitute:

$$0 + 0 = \frac{1}{2}mv^2 - mg(\underbrace{0.8 - 0.8 \sin 30^\circ}_{\Delta \text{ height for board, relative to datum}})$$

translational kinetic energy of board. There is no rotational kinetic energy because the board does not rotate (angular velocity = 0), since it remains in the horizontal orientation.

Solve: $v = 2.8 \text{ m/s}$ (answer)