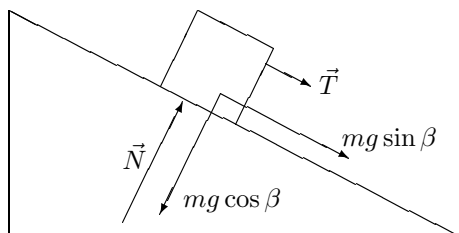


80. We label the 1.0 kg mass m and label the 2.0 kg mass M . We first analyze the forces on m .

The $+x$ direction is “downhill” (parallel to \vec{T}).



With the acceleration (5.5 m/s^2) in the positive x direction for m , then Newton’s second law, applied to the x axis, becomes

$$T + mg \sin \beta = m(5.5 \text{ m/s}^2)$$

But for M , using the more familiar vertical y axis (with *up* as the positive direction), we have the acceleration in the negative direction:

$$F + T - Mg = M(-5.5 \text{ m/s}^2)$$

where the tension comes in as an upward force (the cord can pull, not push).

- (a) From the equation for M , with $F = 6.0 \text{ N}$, we find the tension $T = 2.6 \text{ N}$.
- (b) From the equation for m , using the result from part (a), we obtain the angle $\beta = 17^\circ$.