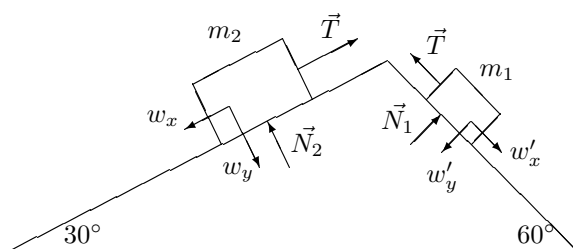


58. For convenience, we have labeled the 2.0 kg box  $m_1$  and the 3.0 kg box  $m_2$  – and their weights  $w'$  and  $w$ , respectively. The  $+x$  axis is “downhill” for  $m_1$  and “uphill” for  $m_2$  (so they both accelerate with the same sign).



We apply Newton's second law to each box's  $x$  axis:

$$\begin{aligned} m_1 g \sin 60^\circ - T &= m_1 a \\ T - m_2 g \sin 30^\circ &= m_2 a \end{aligned}$$

Adding the two equations allows us to solve for the acceleration  $a = 0.45 \text{ m/s}^2$ . This value is plugged back into either of the two equations to yield the tension  $T = 16 \text{ N}$ .