61. From Exercise 4.60(b), \( a_x = g \sin \theta = (9.80 \text{ m/s}^2) \sin 30^\circ = 4.9 \text{ m/s}^2 \) down the slope.

If up the slope is chosen as positive, then \( a = -4.9 \text{ m/s}^2 \). Taking \( x_x = 0 \).

\[
\dot{v}^2 = v_x^2 - 2a(x - x_0), \quad x = \left(0\right)^2 - \left(-25 \text{ m/s}\right)^2 \over 2(-4.9 \text{ m/s}^2) = 64 \text{ m}.
\]

62. First find the mass of the first block. \( m_1 = \frac{\Sigma F}{a} = \frac{40 \text{ N}}{2.5 \text{ m/s}^2} = 16 \text{ kg} \).

Now \( a = \frac{40 \text{ N}}{16 \text{ kg} + 4.0 \text{ kg}} = 2.0 \text{ m/s}^2 \).

63. (a) The angle the rope makes with the horizontal, \( \theta \), depends on both the tree separation and sag.

\[
\Sigma y = 2T \sin \theta - mg = 0, \quad a = \frac{mg}{2 \sin \theta}.
\]

So the tension depends on both the tree separation and sag.

(b) \( \theta = \tan^{-1} \left( \frac{0.20 \text{ m}}{5.0 \text{ m}} \right) = 2.29^\circ \).

\[
T = \frac{(5.0 \text{ kg})(9.80 \text{ m/s}^2)}{2 \sin 2.29^\circ} = 6.1 \times 10^2 \text{ N}.
\]

64. (a) There are two rings. \( \Sigma F_i = T + T - w = 0 \).

So \( T = \frac{w}{2} = \frac{mg}{2} = \frac{(50 \text{ kg})(9.80 \text{ m/s}^2)}{2} = 2.5 \times 10^2 \text{ N} \).

(b) In the vertical direction: \( \Sigma F_i = T \sin \theta + T \sin \theta - mg = 0 \).

So \( T = \frac{mg}{2 \sin \theta} = \frac{(50 \text{ kg})(9.80 \text{ m/s}^2)}{2 \sin 45^\circ} = 3.5 \times 10^2 \text{ N} \).

65. (a) Since the car and the truck accelerate together, they have the same acceleration, \( a \).

For the truck: \( \Sigma F_i = 3200 \text{ N} - T = (3000 \text{ kg})a \). (1)

For the car: \( \Sigma F_i = T = (1500 \text{ kg})a \). (2)

(1) + (2) results \( 3200 \text{ N} = (3000 \text{ kg} + 1500 \text{ kg})a \).

So \( a = \frac{0.711 \text{ m/s}^2}{} \).

Alternate method: Consider the car and truck as a system of mass. \( 3000 \text{ kg} + 1500 \text{ kg} = 4500 \text{ kg} \). \( \Sigma F_i = 3200 \text{ N} = (4500 \text{ kg})a \). 

so \( a = 0.711 \text{ m/s}^2 \).

(b) From (1) in (a), \( T = (1500 \text{ kg})(0.711 \text{ m/s}^2) = 1067 \text{ N} \).