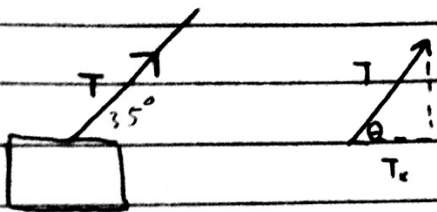


a.

$$W = F \cdot d$$



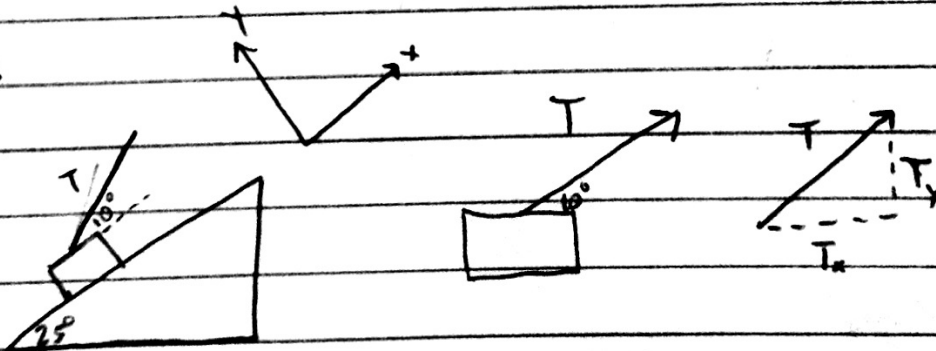
$$T \cos(35^\circ) = T_x$$

$$T_x = 127\text{ N} (0.819)$$

$$T_x = 104.03\text{ N}$$

$$T_x = 104.03\text{ N} (373\text{ m}) = 38.803\text{ kJ}$$

b.



$$T \cos(10^\circ) = T_x$$

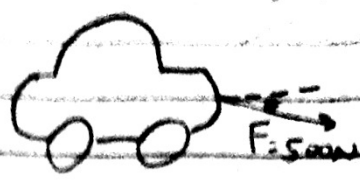
$$T_x = 127\text{ N} (0.985)$$

$$T_x = 125\text{ N}$$

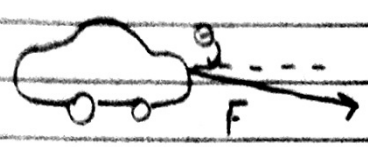
$$125\text{ N} (373\text{ m}) = 46.625\text{ kJ}$$

2

$$\theta = 10^\circ$$



a.



$$F_x = F \cos(10^\circ)$$

F_y is cancelled by N

$$F_x = 500 \text{ N} (0.985)$$

$$F_x = 492 \text{ N}$$

$$W = 492 \frac{\text{J}}{\text{m}}$$

b.

$$W = K_f - K_i = \frac{1}{2} m v^2 - \frac{1}{2} m v_0^2$$

$$v_0 = 0$$

$$F_x = 492 \text{ N}$$

$$W = 5,904 \text{ J}$$

$$v_f = ?$$

$$d = 12 \text{ m}$$

$$m = 1000 \text{ kg}$$

$$W = F_x (12 \text{ m})$$

$$W = \frac{1}{2} m v^2 - \frac{1}{2} m v_0^2$$

$$W = \frac{1}{2} m v^2$$

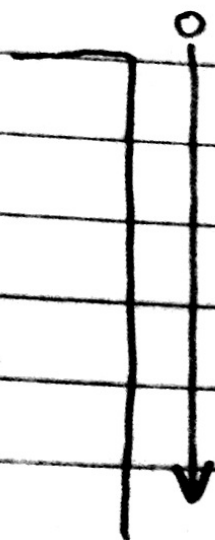
$$5,904 \text{ J} = \frac{1}{2} (1000 \text{ kg}) (v^2)$$

$$\frac{5,904 \text{ J}}{500 \text{ kg}} = v^2$$

$$v^2 = 11.81$$

$$v = 3.4 \text{ m/s}$$

3.



$$U = mgh$$

$$h = 10 \text{ m}$$

Known

$$t = 3.4 \text{ s}$$

Unknown

$$y - y_0$$

$$m = 2.1 \text{ kg}$$

$$a_y = -9.8 \text{ m/s}^2$$

$$v_{0y} = 0 \text{ m/s}$$

$$y - y_0 = v_0 t + \frac{1}{2} a t^2$$

$$y - y_0 = \frac{1}{2} a t^2$$

$$y - y_0 = \frac{1}{2} (-9.8 \text{ m/s}^2) (3.4 \text{ s})^2$$

$$\frac{1}{2} (-9.8 \text{ m/s}^2) (11.56 \text{ s}^2)$$

$$y_0 = 56.6 \text{ m}$$

$$U = 56.6 \text{ m} \cdot (-9.8 \text{ m/s}^2) \cdot 2.1 \text{ kg}$$

$$\boxed{-1,164.8 \text{ kJ}}$$