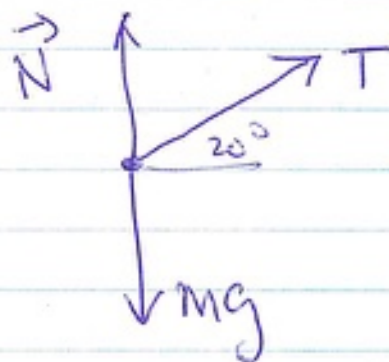
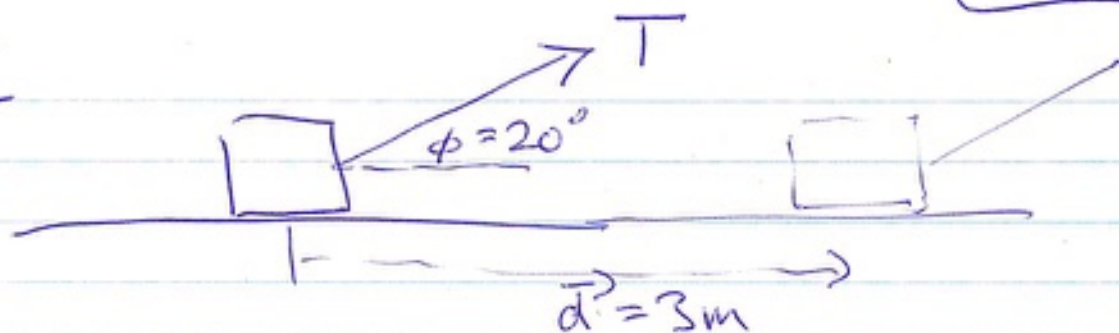


7-58

Lecture 1b



$$W_{\text{total}} = \left(\sum_i \vec{F}_i \right) \cdot \vec{d}$$

$$(a) \quad W_T = \vec{T} \cdot \vec{d} = T d \cos 20^\circ$$

$$= 210 \text{ N} \times 3 \text{ m} \times \cos 20^\circ$$

$$= 590 \text{ N} \cdot \text{m} = 590 \text{ J}$$

New unit of energy

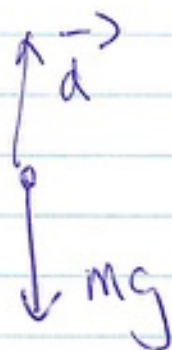
$$1 \text{ Joule} = 1 \text{ N} \cdot \text{m}$$

$$= 1 \text{ kg} \frac{\text{m}^2}{\text{s}^2} \quad (1 \text{ J})$$

$$(b) \quad W_N = \vec{N} \cdot \vec{d} = 0$$

$$(c) \quad W_g = m\vec{g} \cdot \vec{d} = 0$$

$$(d) \quad W_{\text{total}} = 0 + 0 + 590 \text{ J} = 590 \text{ J}$$



$$W_g = (-mg) \Delta y$$

$$(d = \Delta y)$$



$$\Sigma F = F_N - mg = 0$$

for constant
velocity
($a=0$)

$$W_N = F_N \Delta y = mg \Delta y > 0 \quad \text{for } \Delta y > 0 \quad (\Delta y = d)$$

$$W_g = -mg \Delta y$$

$$W_{\text{total}} = W_N + W_g = 0$$