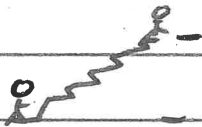


C 6.1 Problems 1, 5, 7, 10

1)  $M = 75.0 \text{ kg}$   
 $h = 10.0 \text{ m}$



$$W = FD = (75.0 \text{ kg})(9.80 \text{ m/s}^2)(10.0 \text{ m})$$

$$W = 7350 \text{ J}$$



$$M_{\text{rock}} = .325 \text{ kg}$$

$$W_T = (.325 \text{ kg})(9.80 \text{ m/s}^2) = 3.185 \text{ N}$$

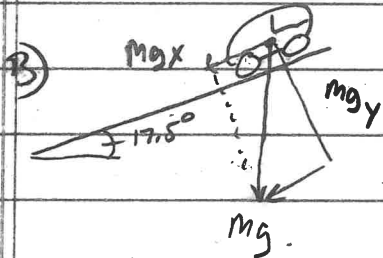
$$\text{Work} = 115 \text{ J}$$

$$W = FD \quad D = \frac{W}{F} = \frac{115 \text{ J}}{3.185 \text{ N}} = 36.1 \text{ m}$$

7)  $m = 1000 \text{ kg}$   $\theta = 17.5^\circ$

$$d_{\text{ramp}} = 300 \text{ m} \quad h = 300 \text{ m} \sin 17.5^\circ = 90.21 \text{ m}$$

a)  $\text{Work}_{\text{min}} = (1000 \text{ kg})(9.80 \text{ m/s}^2)(90.21 \text{ m}) = 8.8 \times 10^5 \text{ J}$



$$Mg_y = F_N = (1000 \text{ kg})(9.80 \text{ m/s}^2) \cos 17.5^\circ$$

$$F_N = 9346 \text{ N}$$

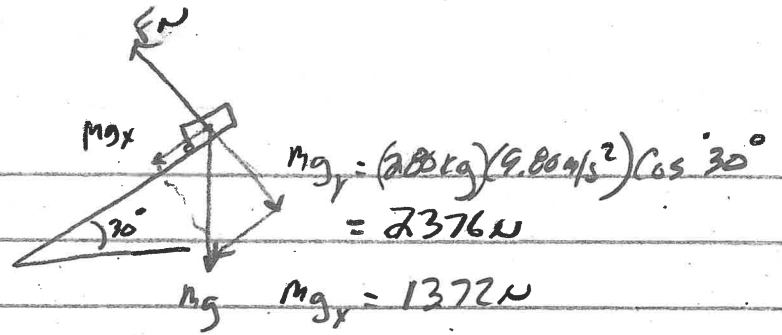
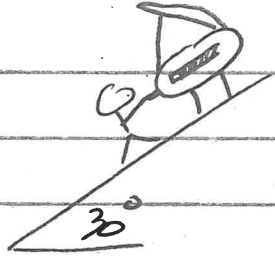
$$F_{\text{fr}} = (9346 \text{ N})(.25) = 2336 \text{ N}$$

$$Mg_x = (1000 \text{ kg})(9.80 \text{ m/s}^2) \sin 17.5^\circ = 2947 \text{ N}$$

$$W = FD = (2947 \text{ N} + 2336 \text{ N})(300 \text{ m})$$

$$W = 1.59 \times 10^6 \text{ J}$$

10)



$$m g_y = (280 \text{ kg})(9.80 \text{ m/s}^2) \cos 30^\circ = 2376 \text{ N}$$

$$m g_x = 1372 \text{ N}$$

$$\theta = 30^\circ$$

$$m = 280 \text{ kg}$$

$$F_{fr} = (2376 \text{ N}) \cdot 0.40 = 950.4 \text{ N}$$

$$d_{\text{ramp}} = 4.3 \text{ m}$$

$$\mu = 0.40$$

$$a = 0 \text{ m/s}^2$$

$$A) F_p = m g_x - F_{fr} = 1372 \text{ N} - 950.4 \text{ N} = 422 \text{ N}$$

$$B) W_p = F D = -422 \text{ N} (4.3 \text{ m}) = -1.81 \times 10^3 \text{ J}$$

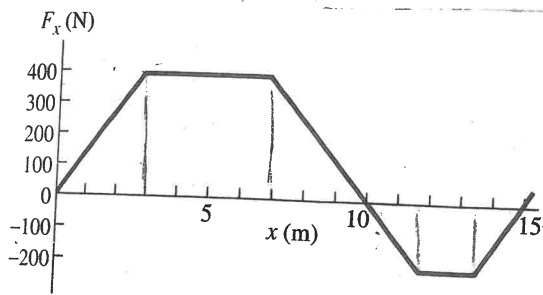
$$C) W_{fr} = (-950.4 \text{ N})(4.3 \text{ m}) = -4.09 \times 10^3 \text{ J}$$

$$D) W_g = (1372 \text{ N})(4.3 \text{ m}) = 5.90 \times 10^3 \text{ J}$$

$$E) W_{\text{NET}} = 5.90 \times 10^3 \text{ J} + (-4.09 \times 10^3 \text{ J}) + (-1.81 \times 10^3 \text{ J}) = 0 \text{ J}$$

AP Phy 6.2

13)



\*  
Area under graph is  
work.

$$a) W_{0 \rightarrow 10m} = \frac{1}{2}(400N)(3m) + (400N)(4m) + \left(\frac{1}{2}\right)(400N)(3m) = 2800J$$

$$b) W_{0 \rightarrow 15m} = W_{0 \rightarrow 10m} - \left(\frac{1}{2}\right)(1.5m)(200N) - (200N)(2m) - \left(\frac{1}{2}\right)(1.5m)(200N) = 2100J$$