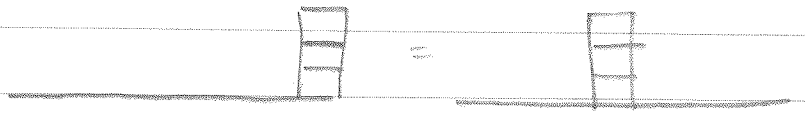
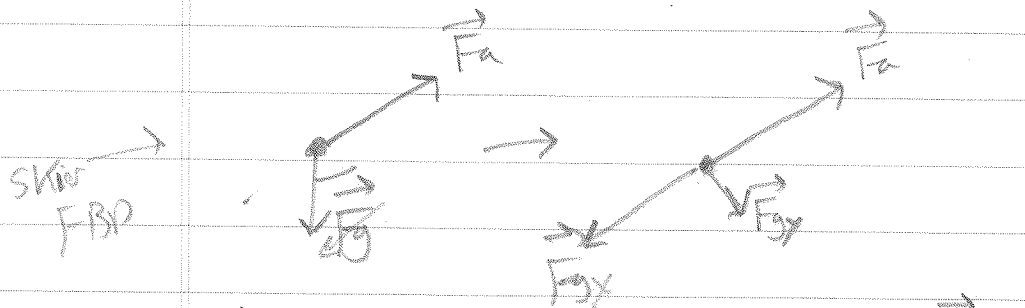
Pg 149 Power: 48, 49, 52 a+b

48.) k $\mu_g$ $\mu_s$ W k $\mu_g$ $\mu_s$

a)






* since toned & constant speed, $\vec{F_a} = \vec{F_{gx}}$

$\hookrightarrow \vec{F_{gx}} = mg\sin\theta = F_a$

$W = \vec{F}\cdot d = = mg\sin\theta \cdot d = (70\,kg \cdot 10\,m/s^2 \cdot \sin(30°)) \cdot (60\,m)$

$W = 21{,}000\,J$

b) $P = \frac{W}{\Delta t} = \frac{F\cdot d}{\Delta t} = F\cdot v = (70\,kg \cdot 10\,m/s^2 \cdot \sin(30°)) \cdot 2.0\,m/s$

$P = 700\,W \;/\; 746\,W = .94\,hp$

49.) $P = 200\,w \rightarrow P = \frac{W}{\Delta t} = \frac{\vec{F}\cdot d}{\Delta t} = F\cdot v$

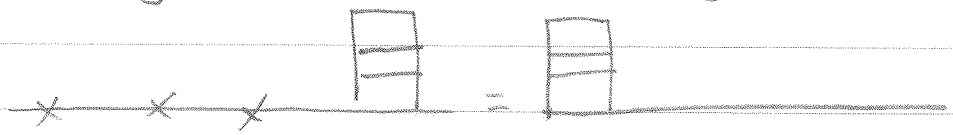
a) * $\vec{F}$ in this case would equal $F_g$ of student

$P = m\cdot g\cdot \vec{v} \rightarrow \vec{v} = \frac{P}{m\cdot g} = \frac{200\,W}{50.0\,kg \cdot 10\,m/s^2} = .40\,m/s$

b) $W = \vec{F}\cdot d = m\cdot g\cdot d = 50.0\,kg \cdot 10\,m/s^2 \cdot 5.0\,m = 2500\,J$

52.) a.) cons. of energy allows us to find $\vec{W}$

$K \quad U_g \quad U_s \quad W \qquad K \quad U_g \quad U_s$



$W = K \rightarrow \quad W = \frac{1}{2}mv_f^2 = \frac{1}{2}(1.50\times10^3 kg)(+10.0 m/s)^2$

$W = +75,000 J$

b.) $P = \frac{\vec{W}}{\Delta t} = \frac{+75,000 J}{3.00 s} = 25,000 W \rightarrow \times \frac{1 hp}{746 W} = 33.5 h.p.$