By 146 & 147: 9, 11, 13, 15, 18

$KE_i + W = KE_f$

9) $KE_i \quad W = KE_f$

a) $K_i + W = K_f$

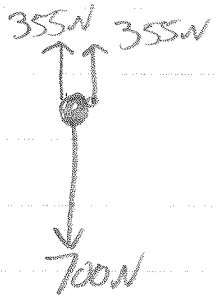
$\hookrightarrow \frac{1}{2}m\vec{v}_i^2 + W = \frac{1}{2}m\vec{v}_f^2$ ($\vec{v}_i$ is "0")

$\hookrightarrow v_f = \sqrt{\frac{\frac{1}{2}m\vec{v}_i^2 + W}{\frac{1}{2}m}} = \sqrt{\frac{W}{\frac{1}{2}m}} = \sqrt{\frac{500J}{(\frac{1}{2}\cdot 2.50\times 10^3 kg)}}$

$v_f = +2.00 m/s$

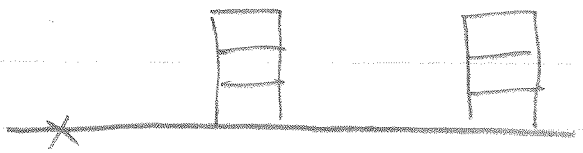
b) $W = \vec{F}\cdot d = \vec{F} = \frac{W}{d} = \frac{500J}{25.0m} = +20.0N$

11)



$\Sigma\vec{F} = (355N + 355N) - 700N = 10N\ up$

$K_i \quad W = K_f$



$K_i + W = K_f$

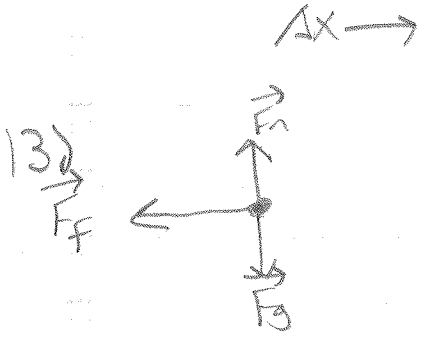
$\hookrightarrow \frac{1}{2}m\vec{v}_i^2 + \vec{F}\cdot d = \frac{1}{2}m\vec{v}_f^2$

$\hookrightarrow \vec{v}_f = \sqrt{\frac{\frac{1}{2}m\vec{v}_i^2 + \vec{F}\cdot d}{\frac{1}{2}m}}$

$\hookrightarrow \vec{v}_f = \sqrt{\frac{\frac{1}{2}70kg(0m/s)^2 + (10N\cdot .25m)}{\frac{1}{2}(70kg)}}$

$\vec{v}_f = +.267 m/s$

13)

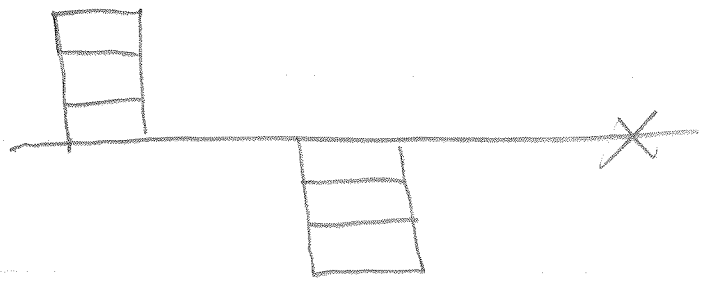


$F_F = \mu \cdot \vec{F}_N = \mu \cdot m \cdot g = .70 \cdot 70kg \cdot 10 m/s^2$

$\vec{F}_F = -490N$

a) by finding W, we find energy lost

$K_i \quad W = K_F$



$K_i + W = K_F \rightarrow W = K_F - K_i$

$W = \frac{1}{2}(70kg)(0m/s)^2 - \frac{1}{2}(70kg)(4.0m/s)^2$

$-560J$

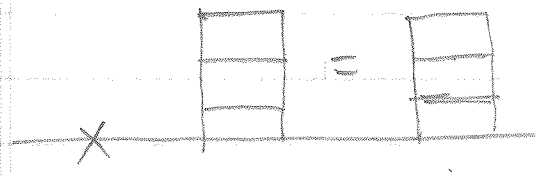
b) $W = \vec{F}d$

$d = \frac{W}{F} = \frac{-560J}{-490N} = 1.1m$

Pg 147: 15

a) $K_F = \frac{1}{2} m \vec{v}_F^2 = \frac{1}{2}(.002\,kg)(300\,m/s)^2 = +90.0\,J$

b) $K_i \quad W = K_F$



$K_i + W = K_F$

$W = K_F - K_i$

$\vec{F} = \frac{\frac{1}{2} m \vec{v}_F^2 - \frac{1}{2} m \vec{v}_i^2}{d}$

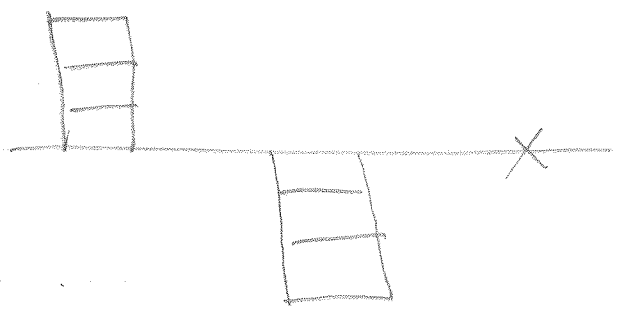
$\vec{F} = \frac{\frac{1}{2}(.002\,kg)(300\,m/s)^2 + 0}{.50\,m}$

$\vec{F} = 180\,N$

Pg 147 #18

$\Sigma \vec{F} = \vec{F}_F$

$K_i + W = K_F$



$K_i + W = K_F$

$\hookrightarrow W = K_F - K_i$

$\hookrightarrow d = \frac{K_F - K_i}{\vec{F} \cdot d}$

$\hookrightarrow d = \frac{K_F - K_i}{\mu \cdot m \cdot g}$

$\hookrightarrow d = \frac{\frac{1}{2} m \vec{v}_F^2 - \frac{1}{2} m \vec{v}_i^2}{\mu \cdot m \cdot g}$

$\hookrightarrow d = \frac{\frac{1}{2}(10\,kg)(0\,m/s)^2 - \frac{1}{2}(10\,kg)(+2.0\,m/s)^2}{(.10)(10\,kg)(10\,m/s^2)}$

$d = 2\,m$