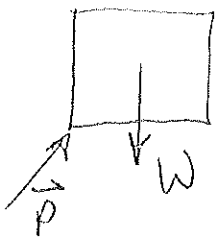
PROB. 13-140

$v_{x,1} = 10 \frac{m}{s}$, $v_{y,1} = 0$, $\Delta t = 0.18^s$, $\theta = 50°$, $|\vec{v}_2| = 12 \frac{m}{s}$

FIND P_y

$$m\vec{v}_1 + \Sigma \vec{IMP}_{1-2} = m\vec{v}_2$$



$$\vec{v}_1 = (10)\hat{i} + (0)\hat{j} \ \frac{m}{s}$$

$$\vec{v}_2 = 12[(\cos 50°)\hat{i} + (\sin 50°)\hat{j}]$$

$$\vec{v}_2 = (7.713)\hat{i} + (9.192)\hat{j} \ \frac{m}{s}$$

$$\vec{P} = (P_x)\hat{i} + (P_y)\hat{j} \ N$$

$$\Sigma \vec{IMP} = \vec{F} \cdot \Delta t = [(P_x)\hat{i} + (P_y)\hat{j} - (W)\hat{j}] \cdot \Delta t$$

Y-DIRECTION:

$$\frac{W}{g} \cdot (0) + (P_y - W)\Delta t = \frac{W}{g} \cdot v_{y,2}$$

$$P_y = W + \frac{W}{g} \cdot \frac{v_{y,2}}{\Delta t} = W\left(1 + \frac{v_{y,2}}{g\,\Delta t}\right)$$

$$P_y = W\left[1 + \frac{(9.192 \frac{m}{s})}{(9.81 \frac{m}{s^2})(0.18^s)}\right] = 6.205 \cdot W$$