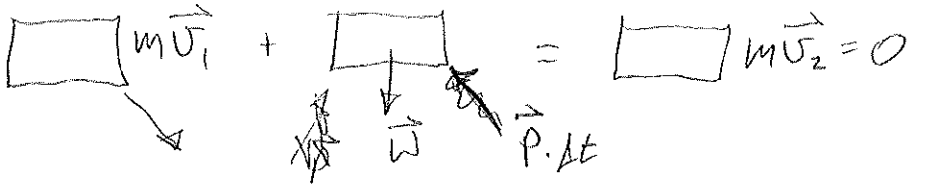
PROB. 13-141

$W = 185^{LB}$, $|\vec{v}_1| = 30\frac{ft}{s}$, $\theta = 360 - 35° = 325°$, $\Delta t = 0.22^{s}$

FIND P_x



$\vec{v}_1 = 30[(\cos 325°)\hat{i} + (\sin 325°)\hat{j}] = (24.57)\hat{i} + (-17.21)\hat{j}\ \frac{ft}{s}$

$\vec{P} = (P_x)\hat{i} + (P_y)\hat{j}$, $\vec{W} = (-W)\hat{j}$, $\vec{v}_2 = 0$

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

$\frac{W}{g}\cdot\vec{v}_1 + \Sigma \overrightarrow{IMP}_{1-2} = 0$

$\Sigma \overrightarrow{IMP}_{1-2} = \vec{F}\cdot\Delta t = (\vec{P} + \vec{W})\cdot\Delta t = [(P_x)\hat{i} + (P_y)\hat{j} + (-W)\hat{j}]\cdot\Delta t$

X-DIRECTION:

$\frac{W}{g}\cdot v_{1,x} + P_x\cdot\Delta t = 0$

$P_x = \frac{W\cdot v_{1,x}}{g\cdot\Delta t} = \frac{(185^{LB})(24.57\frac{ft}{s})}{(32.2\frac{ft}{s^2})(0.22^{s})} = 641.6^{LB}$