PROB. 14-18

$\vec{r}_A = (1200)\hat{i} + (80)\hat{j}$ m

$\vec{r}_1 = (400)\hat{i} + (-200)\hat{j}$ m FIND $\vec{r}_2$

MASS CENTER OF AFTER IMPACT:

$$m\bar{r} = m_A\vec{r}_A + m_1\vec{r}_1 + m_2\vec{r}_2$$

$$\vec{r}_2 = \frac{1}{m_2}\left(m\bar{r} - m_A\vec{r}_A - m_1\vec{r}_1\right)$$

FIND $\bar{r}$ AFTER IMPACT: ASSUME UNIFORM MOTION IN THE X-Y PLANE

$$\bar{r} = \bar{v}_0 \cdot t = (712.6)\hat{i} + (-260.7)\hat{j}\ \text{m}$$

$$\vec{r}_2 = \frac{1}{2000}\cdot\{(4500)[(712.6)\hat{i} + (-260.7)\hat{j}]$$

$$-(1500)[(1200)\hat{i} + (80)\hat{j}] - (1000)[(400)\hat{i} + (-200)\hat{j}]\}$$

$$\vec{r}_2 = (1603)\hat{i} + (-586.6)\hat{j} + (-900)\hat{i} + (-60)\hat{j}$$

$$+ (-200)\hat{i} + (100)\hat{j}$$

$$\boxed{\vec{r}_2 = (503)\hat{i} + (-546.6)\hat{j}\ \text{m}}$$