

Solution 22.5 set 6.

Using μ we can write

$$\vec{r}_1 = \frac{\mu}{m_1} \vec{r}, \quad \vec{r}_2 = -\frac{\mu}{m_2} \vec{r}.$$

Therefore,

$$m_1 \vec{r}_1 \times \vec{v}_1 + m_2 \vec{r}_2 \times \vec{v}_2 = m_1 \frac{\mu}{m_1} \vec{r} \times \vec{v}_1 - m_2 \frac{\mu}{m_2} \vec{r} \times \vec{v}_2 = \mu \vec{r} \times (\vec{v}_1 - \vec{v}_2) = \mu \vec{r} \times \vec{v}.$$