39. Our notation (and, implicitly, our choice of coordinate system) is as follows: the mass of one piece is $m_1 = m$; ; its velocity is $\vec{v}_1 = -30\,\hat{\mathrm{i}}$ in SI units (m/s); the mass of the second piece is $m_2 = m$; ; its velocity is $\vec{v}_2 = -30\,\hat{\mathrm{j}}$ in SI units; and, the mass of the third piece is $m_3 = 3m$. Conservation of linear momentum requires

$$\begin{aligned} m\vec{v}_0 &= m_1\vec{v}_1 + m_2\vec{v}_2 + m_3\vec{v}_3 \\ 0 &= m\left(-30\,\hat{\mathrm{i}}\right) + m\left(-30\,\hat{\mathrm{j}}\right) + 3m\vec{v}_3 \end{aligned}$$

which leads to

$$\vec{v}_3 = 10\,\hat{\mathrm{i}} + 10\,\hat{\mathrm{j}}$$

in SI units. Its magnitude is $v_3 = 10\sqrt{2} \approx 14$ m/s and its angle is 45° counterclockwise from $+x$ (in this system where we have m_1 flying off in the $-x$ direction and m_2 flying off in the $-y$ direction).