74. We choose $\hat{\text{i}}$ East and $\hat{\text{j}}$ North, and use SI units (kg for mass and m/s for speed). The initially moving tin cookie has mass $m_1 = 2.0$ and velocity $\vec{v}_o = 8.0\,\hat{\text{i}}$, and the initially stationary cookie tin has mass $m_2 = 4.0$.

(a) Momentum conservation leads to

$$\begin{aligned} m_1\vec{v}_o &= m_1\vec{v}_1 + m_2\vec{v}_2 \\ 16\,\hat{\text{i}} &= 8\cos(37°)\,\hat{\text{i}} + 8\sin(37°)\,\hat{\text{j}} + (4.0)\vec{v}_2 \end{aligned}$$

which leads to

$$\vec{v}_2 = 2.4\,\hat{\text{i}} - 1.2\,\hat{\text{j}} \implies \vec{v}_2 = (2.7 \angle 27°)$$

where magnitude-angle notation is used. Thus, the speed of the cookie tin is 2.7 m/s.

(b) And its angle is $\tan^{-1}(-1.2/2.4) = -27°$ which can be expressed as $27°$ south of east.