79. Since $(x_0, y_0) = (0, 0)$ and $\vec{v}_0 = 6.0\,\hat{\text{i}}$, we have from Eq. 2-15

$$\begin{aligned} x &= (6.0)t + \frac{1}{2}a_x t^2 \\ y &= \frac{1}{2}a_y t^2 \ . \end{aligned}$$

These equations express uniform acceleration along each axis; the x axis points east and the y axis presumably points north (the assumption is that the figure shown in the problem is a view *from above*). Lengths are in meters, time is in seconds, and force is in newtons.

Examination of any non-zero (x, y) point will suffice, though it is certainly a good idea to check results by examining more than one. Here we will look at the $t = 4.0$ s point, at $(8.0, 8.0)$. The x equation becomes $8.0 = (6.0)(4.0) + \frac{1}{2}a_x(4.0)^2$. Therefore, $a_x = -2.0\ \text{m/s}^2$. The y equation becomes $8.0 = \frac{1}{2}a_y(4.0)^2$. Thus, $a_y = 1.0\ \text{m/s}^2$. The force, then, is

$$\vec{F} = m\vec{a} = -24\,\hat{\text{i}} + 12\,\hat{\text{j}} \quad \longrightarrow \quad (27\ \angle\ 153^\circ)$$

where the vector has been expressed in unit-vector and then magnitude-angle notation. Thus, the force has magnitude 27 N and is directed 63° west of north (or, equivalently, 27° north of west).