28. The coordinate choices are made in the problem statement.

(a) We write the velocity of the armadillo as $\vec{v} = v_x\,\hat{\mathrm{i}} + v_y\,\hat{\mathrm{j}}$. Since there is no net force exerted on it in the x direction, the x component of the velocity of the armadillo is a constant: $v_x = 5.0\,\mathrm{m/s}$. In the y direction at $t = 3.0\,\mathrm{s}$, we have (using Eq. 2-11 with $v_{0\,y} = 0$)

$$v_y = v_{0\,y} + a_y t = v_{0\,y} + \left(\frac{F_y}{m}\right) t = \left(\frac{17}{12}\right)(3.0) = 4.3$$

in SI units. Thus

$$\vec{v} = 5.0\,\hat{\mathrm{i}} + 4.3\,\hat{\mathrm{j}} \quad \mathrm{m/s}\ .$$

(b) We write the position vector of the armadillo as $\vec{r} = r_x\,\hat{\mathrm{i}} + r_y\,\hat{\mathrm{j}}$. At $t = 3.0\,\mathrm{s}$ we have $r_x = (5.0)(3.0) = 15$ and (using Eq. 2-15 with $v_{0\,y} = 0$)

$$r_y = v_{0\,y}\,t + \frac{1}{2}a_y\,t^2 = \frac{1}{2}\left(\frac{F_y}{m}\right) t^2 = \frac{1}{2}\left(\frac{17}{12}\right)(3.0)^2 = 6.4$$

in SI units. The position vector at $t = 3.0\,\mathrm{s}$ is therefore

$$\vec{r} = 15\,\hat{\mathrm{i}} + 6.4\,\hat{\mathrm{j}} \quad \mathrm{m}\ .$$