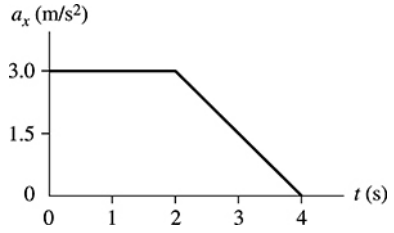
6.28. Visualize:



The acceleration is $a_x = F_x/m$, so the acceleration-versus-time graph has exactly the same shape as the force-versus-time graph. The maximum acceleration is $a_{\max} = F_{\max}/m = (6\text{ N})/(2\text{ kg}) = 3\text{ m/s}^2$.

Solve: The acceleration is not constant, so we cannot use constant-acceleration kinematics. Instead, we use the more general result that

$$v(t) = v_0 + \text{area under the acceleration curve from 0 s to } t$$

The object starts from rest, so $v_0 = 0$ m/s. The area under the acceleration curve between 0 s and 4 s is a rectangle $(3\text{ m/s}^2 \times 2\text{ s} = 6\text{ m/s})$ plus a triangle $\left(\frac{1}{2} \times 3\text{ m/s}^2 \times 2\text{ s} = 3\text{ m/s}\right)$. Thus $v_x = 9$ m/s at $t = 4$ s.