8. Since this involves constant-acceleration motion, we can apply the equations of Table 2-1, such as $x = v_0 t + \frac{1}{2}at^2$ (where $x_0 = 0$). We choose to analyze the third and fifth points, obtaining

$$\begin{aligned} 0.2\,\text{m} &= v_0(1.0\,\text{s}) + \frac{1}{2}a\,(1.0\,\text{s})^2 \\ 0.8\,\text{m} &= v_0(2.0\,\text{s}) + \frac{1}{2}a\,(2.0\,\text{s})^2 \end{aligned}$$

Simultaneous solution of the equations leads to $v_0 = 0$ and $a = 0.40\,\text{m/s}^2$. We now have two ways to finish the problem. One is to compute force from $F = ma$ and then obtain the work from Eq. 7-7. The other is to find ΔK as a way of computing W (in accordance with Eq. 7-10). In this latter approach, we find the velocity at $t = 2.0$ s from $v = v_0 + at$ (so $v = 0.80$ m/s). Thus,

$$W = \Delta K = \frac{1}{2}(1.0\,\text{kg})(0.80\,\text{m/s})^2 = 0.32\ \text{J}\ .$$