9.4. **Model:** The particle is subjected to an impulsive force.
Visualize: Please refer to Figure EX9.4.
Solve: Using Equation 9.6, the impulse is the area under the curve. From 0 s to 2 ms the impulse is

$$\int F dt = \tfrac{1}{2}(-500\text{ N})\left(2\times10^{-3}\text{ s}\right) = -0.5\text{ N s}$$

From 2 ms to 8 ms the impulse is

$$\int F dt = \tfrac{1}{2}(+2000\text{ N})(8\text{ ms} - 2\text{ ms}) = +6.0\text{ N s}$$

From 8 ms to 10 ms the impulse is

$$\int F dt = \tfrac{1}{2}(-500\text{ N})(10\text{ ms} - 8\text{ ms}) = -0.5\text{ N s}$$

Thus, from 0 s to 10 ms the impulse is $(-0.5 + 6.0 - 0.5)$ N s $= 5.0$ N s.