$$\text{velocity } v \quad = \quad \frac{\text{change in position}}{\text{change in time}} \quad = \quad \frac{\text{displacement}}{\text{time interval}}$$

$$\text{average velocity} \quad = \quad \frac{x_2 - x_1}{t_2 - t_1}$$

$$\text{instantaneous velocity} \quad = \quad \lim_{(t_2 - t_1) \to 0} \left(\frac{x_2 - x_1}{t_2 - t_1} \right) \quad = \quad \frac{dx}{dt}$$

$$\text{acceleration } a \quad = \quad \frac{\text{change in velocity}}{\text{change in time}}$$

$$v_f \quad = \quad 60 \left(\frac{\text{miles}}{\text{hour}} \right) \times \left(\frac{1609 \text{ m}}{1 \text{ mile}} \right) \times \left(\frac{1 \text{ hour}}{3600 \text{ s}} \right) \quad = \quad 26.8 \, \frac{m}{s}$$

$$\text{average acceleration } a \quad = \quad \frac{26.8 \; m/s \; - \; 0 \; m/s}{4.8 \; s} \quad = \quad 5.6 \, \frac{m}{s^2}$$

$$\text{instantaneous acceleration} \quad = \quad \lim_{(t_2 - t_1) \to 0} \left(\frac{v_2 - v_1}{t_2 - t_1} \right) \quad = \quad \frac{dv}{dt} \quad = \quad \frac{d^2x}{dt^2}$$

$$y(t) \quad = \quad 10 \, \text{m} \; + \; \left(3 \, \frac{\text{m}}{\text{s}} \right) \, t \; - \; \left(4.9 \, \frac{\text{m}}{\text{s}^2} \right) \, t^2$$