University Physics with Modern Physics, 15/e
Young/Freedman
Chapter 2 Key Equations

$$v_{\text{av-}x} = \frac{\Delta x}{\Delta t} = \frac{x_2 - x_1}{t_2 - t_1} \quad \text{(Average } x\text{-velocity, straight-line motion)} \tag{2.2}$$

$$v_x = \lim_{\Delta t \to 0} \frac{\Delta x}{\Delta t} = \frac{dx}{dt} \quad \text{(instantaneous } x\text{-velocity, straight-line motion)} \tag{2.3}$$

$$a_{\text{av-}x} = \frac{\Delta v_x}{\Delta t} = \frac{v_{2x} - v_{1x}}{t_2 - t_1} \quad \text{(Average } x\text{-acceleration, straight-line motion)} \tag{2.4}$$

$$a_x = \lim_{\Delta t \to 0} \frac{\Delta v_x}{\Delta t} = \frac{dv_x}{dt} \quad \text{(instantaneous } x\text{-acceleration, straight-line motion)} \tag{2.5}$$

$$v_x = v_{0x} + a_x t \quad (x\text{-velocity, constant } x\text{-acceleration}) \tag{2.8}$$

$$x = x_0 + v_{0x} t + \frac{1}{2} a_x t^2 \quad \text{(Position, constant } x\text{-acceleration)} \tag{2.12}$$

$$v_x^2 = v_{0x}^2 + 2a_x (x - x_0) \quad (x\text{-velocity, constant } x\text{-acceleration}) \tag{2.13}$$

$$x - x_0 = \frac{1}{2}(v_{0x} + v_x) t \quad \text{(constant } x\text{-acceleration)} \tag{2.14}$$