

## Information for the Quiz on Ch. 2

### Fundamental Concepts

Things you must know:

(1) Definition of and approximation for average velocity (and the position update formula)

(2) Definition of momentum  $\gamma = \frac{1}{\sqrt{1 - (|\bar{v}|/c)^2}}$

(3) The Momentum Principle (and the momentum update formula)

### Specific Results

Projectile Motion:

$$x_f = x_i + v_{xi} \Delta t$$

$$y_f = y_i + v_{yi} \Delta t - \frac{1}{2} g (\Delta t)^2$$

$$v_{xf} = v_{xi}$$

$$v_{yf} = v_{yi} - g \Delta t$$

$$|\vec{F}_{\text{grav}}| \approx mg \text{ near Earth's surface} \quad |\vec{F}_{\text{spring}}| = k_s |s|$$

### Physical Constants

$$c = 3 \times 10^8 \text{ m/s}$$

$$g = 9.8 \text{ m/s}^2$$

$$m_{\text{proton}} = 1.7 \times 10^{-27} \text{ kg}$$

$$m_{\text{electron}} = 9 \times 10^{-31} \text{ kg}$$