

## PH 125 Quiz 3

$$W = \int_{r_i}^{r_f} \vec{\mathbf{F}} \cdot d\vec{\mathbf{r}} = \int_{x_i}^{x_f} F_x \cdot dx \qquad \Sigma W = K_f - K_i = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

1. The magnitude of the force on a spring as a function of its displacement from equilibrium ( $x = 0$ ) can be written  $F = -kx$ , where  $k$  is the "force constant" of the spring. What is the amount of work done in stretching the spring from  $x = 0$  to  $x = x_f$ ?
  
2. What is the work done when a 3 kg object free-falls 1 m straight down, relative to the earth's surface? You can neglect air resistance, and let  $g = 10 \text{ m/s}^2$ .
  
3. If you did *not* ignore air resistance in question 2, which of the following would be true?
  - The work done would be more, work is done against air resistance and gravity.
  - The work done would be less, air resistance is countering work by gravity.
  - The work done would be the same, the force of air resistance does no work.
  - Cannot be determined without knowing the precise nature of the force of air resistance.