

Name _____

PH 125 Quiz 5: Its not Work if you do it right

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

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.