

## Hooke's Law Pre-lab Test (10 Points)

Print Name \_\_\_\_\_

Lab Section \_\_\_\_\_ Date \_\_\_\_\_ TA \_\_\_\_\_

**This Pre-lab is due when you come in to do the experiment. Show formulas and results as specified below, but you should use Excel to perform the numerical calculations.**

1. In this experiment, a  $0.20\text{ kg}$  mass ( $m_1$ ) hangs vertically from a spring and an elongation of the spring of  $9.50\text{ cm}$  ( $r_1$ ) is recorded. With a mass ( $m_2$ ) of  $1.00\text{ kg}$  hanging on the spring, a second elongation ( $r_2$ ) of  $12.00\text{ cm}$  is recorded. Calculate the spring constant  $k$  in Newtons per meter (N/m). (Note: The equilibrium position is *not* zero.)

$$k =$$

2. If the same spring (as in part 1) causes an elongation ( $r_3$ ) of  $18\text{ cm}$  when a mass ( $m_3$ ) is attached to it, what will be the mass in SI units?

$$m_3 =$$

3. If the same mass ( $m_3$ ) causes an elongation ( $r_4$ ) of  $5\text{ cm}$  when it is attached to a different spring, what will be its spring constant  $k$  in Newtons per meter (N/m). The equilibrium position is  $1.3\text{ cm}$ .

$$k =$$