Hooke's Law and Simple Harmonic Motion        Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner(s):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    Course:\_\_\_\_\_\_\_\_\_\_\_\_\_\_    Time:\_\_\_\_\_\_\_\_\_\_\_\_

1. Hooke’s Law

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1. Purpose: Investigate a simple harmonic motion.

**DATA (Use SI units):**

Oscillating Mass = m = \_\_\_\_\_\_\_\_\_\_\_Spring Constant (from Part A) = k = \_\_\_\_\_\_\_\_\_\_\_\_

I) From the Position VS. Time graph obtain the following:  
  
a. Equilibrium Position = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Amplitude of the Oscillation = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Period of the Oscillation = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. Calculate the period (using spring constant and oscillating mass) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
  
II) Click Position, choose velocity, and from the Velocity VS. Time graph obtain the following:  
  
a. Maximum Velocity =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Period of the Oscillation = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Calculate the period (using amplitude and maximum velocity) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

III) Click Velocity, choose acceleration, and from the Acceleration VS. Time graph obtain the following:  
  
a. Maximum Acceleration =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Period of the Oscillation = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Calculate the Maximum force = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. Calculate the period (using amplitude and maximum acceleration) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A screenshot of a graph

Description automatically generated

Circle the answers for following questions, by looking at the oscillating mass and using your display:

1. During the oscillation when the mass is at the equilibrium position, what is the,

1. Velocity: maximum OR zero b. Acceleration: maximum OR zero

2. During the oscillation when the velocity of the mass is zero, what is the,

1. Position: equilibrium OR crest/trough b. Acceleration: maximum OR zero

3. During the oscillation when the acceleration of the mass is zero, what is the,

1. Position: equilibrium OR crest/trough b. Velocity: maximum OR zero