

Physics 200B
Prelab exercise 8

Name: _____

Directions: Read over Lab 8 and then answer the following questions about the procedures.

1. *Prediction:* What is your Prediction 1-1? How will kinetic energy, gravitational potential energy, and mechanical energy change as the cart rolls down the ramp?

2. In Activity 1-1, what two locations will you use as origins for your coordinate system?

3. In Activity 2-1, what two quantities will you measure to find the spring constant of the spring?

4 & 5. A spring with spring constant k is hanging vertically. An object with mass m is attached to the end. The mass is released from rest when the spring is at its unstretched position, and drops straight down. Take the gravitational potential energy to be zero at the initial (unstretched) position. That makes the initial mechanical energy equal to zero (no KE, no PE of any kind).

a) Write down an expression for the mechanical energy when the mass has fallen a vertical distance Δx . (Hint: KE and both types of PE will be nonzero. Your answer should contain k , m , Δx , g , v , and numerical constants.)

b) Use conservation of energy and the expression you found in a) to write an expression for the speed at this point in terms of k , m , Δx , g , and numerical constants.