

Name: \_\_\_\_\_ Lab Section: \_\_\_\_\_ Date: \_\_\_\_\_

## PreLab: Falling Body

**Instructions:** Prepare for this lab activity by answering the questions below. Note that this is a **PreLab**. It must be turned in at the start of the lab period. Time cannot be given in lab to perform PreLab activities. After the start of lab activities, PreLabs cannot be accepted. Explain your answers. Points will be taken off if your work is not neat and well organized.

- (10 points) Which of the following statements is correct for an object released from rest, freefalling in the Earth's gravity? (Neglect air resistance.) **Circle all true statements.** If the statement is incorrect rewrite the statement, in the space below the incorrect statement, to make it correct.
  - during each second the object travels 4.9 m
  - the average speed at time  $t = 4\text{s}$  is 39.2 m/s
  - the instantaneous speed at time  $t = 3\text{s}$  is 29.4 m/s
  - the average acceleration at time  $t = 1\text{s}$  is  $9.8\text{ m/s}^2$
  - the average acceleration at time  $t = 3\text{s}$  is  $29.4\text{ m/s}^2$
- (5 points 1408/3 points 1420) In the procedure, you are instructed to measure the distance from the bottom of the ball to the top of the pad. Suppose your lab partner makes a mistake and measures the distance from the top of the ball to the top of the pad. We will assume that this makes the height measurement 0.2 cm too large. How would your experimental determined value of  $g$  be impacted? Explain in at least three complete sentences.
- (1420 ONLY 2 points) Find the first derivative of  $f(x) = \ln(x^2 + 3x + 3)$