Name ____ Professor Arnold

Math 140 Project 1 August 26, 1994

Let $s(t)$ denote the height of the ball in centimeters above ground t seconds after it is released. In this project we will study the function $s(t)$ graphically and algebraically.

1. What is the domain of $s(t)$?

2. What is the range of $s(t)$?

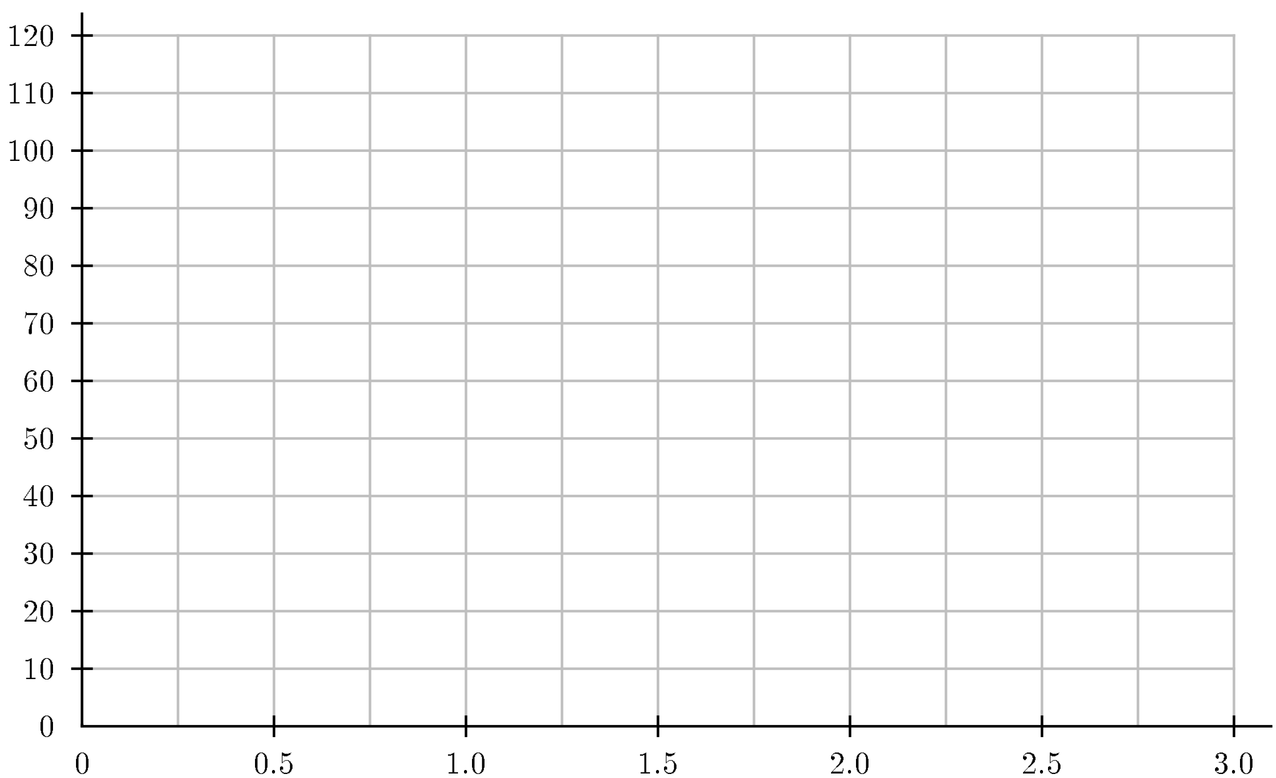
3. How many seconds after it is released does the ball first contact the ground?

4. How many seconds after release until it hits ground the second time? The third time?

5. How high does the ball bounce after hitting ground the first time?

6. At what time after the first hit, does the ball reach its maximum height?

Plot a graph of $s(t)$.



7. Try to think up a formula for $s(t)$ which is valid for the time interval from the first time of contact of the ball with the ground to the second. Your formula should match all the information you gathered above. Explain clearly how you arrived at your formula.

$s(t) =$ for $\leq t \leq$.

8. Try to think up a formula for $s(t)$ from the moment of release to the time of first contact. Again explain your reasoning.

9. Use correct mathematical notation to express the function $s(t)$ over the entire interval from the time of release to the time of the second contact with the ground.