Instructions:

- All problems are due at the beginning of class on Monday 10/13.
  (Except for the Tu/Th evening section. Consult your instructor!)
- Quality of presentation is a significant part of your grade. This includes:
  - Neatness. Sloppy work will score poorly, if it gets graded at all.
  - Organization. Your work must be easy to find and easy to follow.
  - Communication. Your work must show how you reached your answer, and you must
    make correct use of mathematical notation.
  - Pay attention to specific answer formatting requirements in each individual problem.
  - Your instructor may have additional requirements.

Problems: All problems refer to the following situation. An object on the end of a spring moves
up and down. Its height is given by

\[ h(t) = 5 + 10e^{-0.3t}\sin(1.5t) \]

with \( t \) in seconds and \( h \) in millimeters (mm).

1. (4 pts.) Graph the height function on the domain \( 0 \leq t \leq 20 \) seconds. Your graph must
   be properly labeled. Your graph must be clear enough to illustrate the damped oscillations.
   Neatness counts!

2. (6 pts.) Answer the questions below using one word or a short phrase.

   (a) What does \( h \) measure?
   (b) What are the units on \( h \)?
   (c) What does \( t \) measure?
   (d) What are the units on \( t \)?
   (e) What does \( \frac{dh}{dt} \) measure?
   (f) What are the units on \( \frac{dh}{dt} \)?
   (g) What does \( \frac{d^2h}{dt^2} \) measure?
   (h) What are the units on \( \frac{d^2h}{dt^2} \)?
3. (10 pts.) In your graph of \( h \) mark or otherwise indicate the first instant when the velocity of the object is zero. Find the rate of change of velocity at that instant.

**Note:** For full credit you must:

- Show work that clearly communicates how you arrived at your answer.
- Include proper explanation of calculator use. If you use your calculator to find solutions to equations, *read this*.
- Similarly, if you use your calculator to compute derivatives, indicate what you typed into your calculator and what feature(s) you used.
- Include correct units and be accurate to two decimal places.
- Write a final sentence that states your answer and explains what it means in the context of the problem.