

Name \_\_\_\_\_

- You may work with other students in this class. However each student should write up solutions separately and independently – nobody should copy someone else’s work.
- You may use your notes or the textbook.
- Computers are not allowed on any problem. You may use a calculator only for basic arithmetic.
- You must show sufficient work to justify each answer.
- The quiz should be turned in to your TA at the beginning of your discussion section meeting on Tuesday, October 11th.
- Be sure that the pages are nicely stapled – do not just fold the corners.
- **Note to TAs and Tutors – you should not help students with these specific problems or go over solutions until after 4pm Tuesday.**

1. (3 points) Suppose  $y_1$  is a function of  $x$  for which  $\frac{dy_1}{dx} = 3y_1$ . Suppose  $y_2$  is a function of  $x$  for which  $\frac{dy_2}{dx} = 8x + 5$ . If the graphs of  $y_1$  and  $y_2$  have the same  $y$ -intercept and they intersect at  $x = 2$ , then determine the value of the  $y$ -intercept.

2. (4 points) A bullet is fired upwards from the ground at an initial velocity of 1200 feet per second. The height  $s$  (in feet) of the bullet above the ground after  $t$  seconds is  $s = 1200t - 6t^2$  on Mars and  $s = 1200t - 16t^2$  on Earth. How much higher will the bullet travel on Mars than on Earth?

3. (3 points) An observer stands 200 meters from the launch site of a hot-air balloon. The balloon rises vertically at a constant rate of 4 meters per second. How fast is the angle of elevation of the balloon increasing 30 seconds after the launch?