Math 115 Quiz 2: § 1.6-1.8, 2.1 **Name:** _____
Mon 27 September 2010

You have 15 minutes to complete this quiz. Calculators are OK. Eyes on your own paper and good luck!

1. **Definitions/Concepts.** (1 pt each) Suppose that $\lim_{x\to 3} f(x) = 7$. Are the following statements true or false? If a statement is true, explain how you know. If a statement is false, give a counterexample.

   (a) $\lim_{x\to 3} (xf(x)) = 21$.

   (b) If $g(3) = 4$, then $\lim_{x\to 3} (f(x) + g(x)) = 28$.

2. **Questions/Problems.** A ball is tossed into the air from a bridge, and its height, y (in feet), above the ground t seconds after it is thrown is given by

$$y = f(t) = -16t^2 + 50t + 36.$$

   (a) (1 pt) How high above the ground is the bridge?

   (b) (1 pt) What is the average velocity of the ball for the first second?

   (c) (1 pt) Approximate the velocity of the ball at $t = 1$ second.

   (d) (2 pts) Graph f, and determine the maximum height the ball reaches. What is the velocity at the time the ball is at its peak?

   (e) (1 pt) Use the graph to decide at what time, t, the ball reaches its maximum height.

3. **Computations/Algebra.** (1 pt each)

(a) Find k so that the following function is continuous on any interval:

$$f(x) = \begin{cases} kx & x \leq 3 \\ 5 & 3 < x \end{cases}$$

(b) Find k so that the following function is continuous on any interval:

$$f(x) = \begin{cases} kx & 0 \leq x < 3 \\ 3x^2 & 2 \leq x \end{cases}$$