## Math 251: Pledged Set 2

Due: September 18, 2007

This is a pledged set. Therefore, no outside help from book, calculator, or other people.

- 1. Suppose an object moves along a curve with position f(t) at time t. Write an expression for the instantaneous velocity of the object at time t = a. How can you interpret this velocity in terms of the graph of f?
- 2. Explain what it means to say

$$\lim_{x \to 1^{-}} f(x) = 2$$
 and  $\lim_{x \to 1^{+}} f(x) = 4$ 

In this situation is it possible that  $\lim_{x\to 1} f(x)$  exists? Explain.

3. (a) Explain what is wrong with the following equation

$$\frac{x^2 + x - 6}{x - 2} = x + 3.$$

(b) Explain why the equation

$$\lim_{x \to 2} \frac{x^2 + x - 6}{x - 2} = \lim_{x \to 2} x + 3$$

is correct.

4. Evaluate the limit and justify each step by indicating the appropriate Limit Law(s).

$$\lim_{x \to 2} \frac{2x^2 + 1}{x^2 + 6x - 4}$$

5. Evaluate (if it exists)

$$\lim_{x \to -4} \frac{\sqrt{x^2 + 9} - 5}{x + 4}$$