Math 251: Pledged Set 2

Due: September 17, 2009

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

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

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

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

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

4. Evaluate (if it exists)

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

5. Prove using the ϵ, δ definition that

$$\lim_{x \to 2} (14 - 5x) = 4$$