

## Math 251: Pledged Set 2

Due: January 26, 2010

*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

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

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

3. Evaluate the limit

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

4. Evaluate (if it exists)

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

5. Prove using the  $\epsilon, \delta$  definition that

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