Name: _____ Math 211 Quiz 3

Section: 302 ☐ 303 ☐ Feb 8, 2012

1. Find the indicated limit. If the limiting value is infinite, indicate whether it is $+\infty$ or $-\infty$.

a. $\lim_{x\to 1} \dfrac{x^2+4x-5}{x^2-1}$ **b**. $\lim_{x\to\infty} \dfrac{2x^2-3x}{x^2-1}$ **c**. $\lim_{x\to-\infty} \dfrac{x^3+x}{2x^2+1}$ **d**. $\lim_{x\to 1^-} \dfrac{1}{x-1}$

2. Compute the derivative of the given function and find the slope of the line that is tangent to its graph for the specified value of the independent variable.

a. $f(x) = x^2 - 1; \quad x = -1$ **b**. $g(t) = \sqrt{t}; \quad t = 4$

3. Show that the equation $\sqrt{x} = x^2 + 2x - 1$ must have at least one solution on the interval $0 \leq x \leq 1$. *hint: use intermediate value property of continuous functions.*

Bonus Problem. A toy rocket rises vertically in such a way that t seconds after liftoff, it is $h(t) = -16t^2 + 200t$ feet above the ground.
a. How high is the rocket after 6 seconds?
b. What is the average velocity of the rocket over the first 6 seconds?
c. What is the velocity of the rocket at liftoff? What is its velocity after 6 seconds?