1pm

Quiz 2

Spring 2012 **Your name:** _____

Math 0220 **Your TA's name:** _____

No calculators. Show all your work (no work = no credit). Write neatly.

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1. (a) [3 points] Does the function $f(x) = \dfrac{x^3 + 64}{x + 4}$ have removable discontinuity at -4. Support your answer.

(b) [2 points] If the discontinuity is removable, find a function $g(x)$ that agrees with $f(x)$ for $x \neq -4$ and is continuous at -4.

2. [5 points] Evaluate the limit, if it exists. If it does not exist explain why.

$$\lim_{x \to \infty} \left(\sqrt{9x^2 + 2x} - 3x \right)$$

3. [5 points] Sketch the graph of an example of a function $g(x)$ if it satisfies all the given conditions

$$g(0) = 0, \quad g'(0) = 3, \quad g'(1) = 0, \quad \text{and} \quad g'(2) = -1$$

bonus problem [5 points extra] Use the definition of the derivative to compute the derivative of the function $g(x) = f(2x)$ at a number $x = a$, where f is a differentiable function.