

Name:

1/27/06

Math 251 Quiz 3B

1. At which point(s) is the function f discontinuous, where

$$f(x) = \begin{cases} 7 & \text{if } x < -2, \\ x^2 + 3 & \text{if } -2 \leq x \leq 3, \\ 3x & \text{if } x > 3. \end{cases}$$

[Be sure to justify your answer.]

2. Prove that there exists a number a such that $g(a) = 6.3875$ where

$$g(x) = x^4 + 2x + 5$$

3. Evaluate the following limit, if it exists.

$$\lim_{x \rightarrow -\infty} (x - 3)^2(4 - x)^3(2 - x)^2$$

4. Evaluate the following limit, if it exists.

$$\lim_{x \rightarrow \infty} \frac{\sqrt{3x^2 + 3x}}{13 - 4x}$$