

Name \_\_\_\_\_

Math 115  
Calculus I  
Fall, 2008

### Quiz 3

**Problem 1** Use the Intermediate Value Theorem to show that the equation

$$e^{-x} - 1 = 0$$

has a solution in the interval  $[-1, 1]$ .

**Problem 2** Explain why the function

$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ 2 & x = 2 \end{cases}$$

is not continuous at the point  $x = 2$ .

**Problem 3** Find the limits of the following functions:

a)  $\lim_{x \rightarrow \infty} \frac{4x^4+1}{2x^4+x^3+3x^2+x+1}$

b)  $\lim_{x \rightarrow \infty} \frac{5x^2+2x+1}{\sqrt{25x^4+3}}$

c)  $\lim_{x \rightarrow -\infty} \frac{x+1}{-2x+3}$