Math 1A Worksheet 6

September 12th, 2007

1. Draw a graph of the function

$$f(x) = \frac{x+3}{|x+2|}.$$

Allowing for ∞, find:

$$\lim_{x \to -2^+} f(x)$$

and

$$\lim_{x \to -2^-} f(x).$$

Is $f(x)$ continuous at 2?

2. Let g be the function given by:

$$f(x) = \left\{ \begin{array}{lll} -3x^2 & , & x \leq -1 \\ [[x]] & , & -1 < x < 1/2 \\ x - 1/2 & , & 1/2 \leq x \end{array} \right\}.$$

Where is g continuous?

3. Is there an x such that

$$e^x = x^4 - x?$$

Explain why or why not.

4. Make a function h as follows: for each real number x, pick a random number between 0 and 1 and call this number $h(x)$ (so maybe $h(0) = e/3$ and $h(\pi) = 7/11$). Using the squeeze theorem, show that

$$\lim_{x \to 0} xh(x)$$

exists. Is the function $xh(x)$ continuous at 0?