MAT 261 HOMEWORK 3: Due Friday, Sept. 22

If f is a function on the real line, and a and L are real numbers, we say that f has the **limit** L as x approaches a, denoted $\lim_{x\to a} f(x) = L$, if for all $\varepsilon > 0$ there exists $\delta > 0$ such that $|f(x) - L| < \varepsilon$ whenever $0 < |x - a| < \delta$.

(1) Translate the above definition into symbolic notation:
We say $\lim_{x\to a} f(x) = L$ if $\forall \varepsilon > 0, \ldots$

(2) Use the rules of negation, together with your symbolic notation above, to give (in symbols) the meaning of the statement: L is not the limit of f as x approaches a. Your answer should not involve any $\sim$ symbols.

(3) Translate the symbolic statement from part 2 into words (accompanying mathematical symbols are allowed).

(4) Use your negation definition to prove that $\lim_{x\to 2} \dfrac{1}{x} \neq 5$.

(5) Do Webwork set1 and set "quantifiers".

(6) (Not to hand in) Do lots of odd problems in the book (chapter 2 and starting chapter 4). Check your answers in the back.