7 Writing Assignment Due Thursday, March 12

Prompt. A friend comes to you with the following variant of the epsilon-delta definition of limit:

"We say that $\lim_{x\to a} f(x) = L$ if for every $\delta > 0$, there exists a $\epsilon > 0$ so that $0 < |x - a| < \delta \implies |f(x) - L| < \epsilon$."

Note: The *only* difference between the usual definition is that your friend has written "For every $\delta > 0$, there exists an $\epsilon > 0$" instead of "For every $\epsilon > 0$, there exists a $\delta > 0$."

Explore the implications of your friend's variant. Is this indeed a definition that captures your intuition of what a limit should be? Are there known examples of limits that *fail* your friend's definition? (Better yet, does your friend's definition fail a known example of a limit?)

Some guidelines. You *must* think for a long time to even begin to understand. I will repeat what I said above: **Spend at least two hours thinking and exploring** before you even begin to write your assignment.

Format. See online. Only PDF uploads are accepted on Canvas.

Grading. Remember that I am looking for your *thinking*. Flowery language for the sake of flowers, or cookie-cutter essay words, won't help your grade! I am looking for your engagement with the mathematics.