Math 15200/14 Homework 1
Due date: Thursday, October 10, 2019, 5pm (in my mailbox in Eckhart basement)

Please present your solutions clearly and in an organized way. Think of it this way: if you show it to another student in this class, he/she should be able to understand it without needing to ask you questions.

Wolfram Alpha

Wolfram Alpha is a very useful tool. Check it out if you have not used it before: `http://wolframalpha.com`. For example, try entering the following text into Wolfram Alpha:

- `plot y = sin(1/x)` (direct link)
- `limit of sin(1/x) as x -> 0` (direct link)

October 1

Goals:

- Review how to work with limits in an intuitive way

Exercises 2.1:

- 1, 3, 5, 7, 9, 11 (Just write down the answers, no justification needed.)
- 17, 21, 23, 38, 43 (Please include a sketch of the graph and write down the answer. No justification needed.)

October 3

Goals:

- Get some practice with (ϵ, δ) definition of limits.

Exercises 2.2:

- 21, 23, 25, 27, 29 (For these problems, the book gives you an $\epsilon > 0$. You have to say what $\delta > 0$ to respond with. Sketch a graph to justify why your δ works. You do not need to justify with mathematical equations. **Note:** The answers at the back of the book give a single value for δ, but answers can vary. Your δ does not have to match the book's.)
- 35, 37 (For these problems, please write out the proofs, like we did in Example 1 in class today.)

October 8

Goals:

- Review basic theorems about continuity
- Practice computing derivatives

Exercises 2.4:

- 1

Exercises 2.6:

- 13, 14, 15, 16, 17, 23, 24

Exercises 3.5:

- 9, 17

This is all for HW 1.