MTH 327H: Homework 1

Due: September 7, 2018

1. Send me an e-mail introducing yourself. Let me know if you like to be called something other than your registrar listing, and anything you think I should know about your background.

2. Office hours the first week of classes are W 3-4 and Th 9-10; office hours the second week of classes are T 9-10, W 3-4, and Th 9-10. (Note change from Monday to Tuesday due to holiday.)

3. This week, read the supplementary readings on "Logic and Proof" and "Sets and Functions" on the course website. For next week, read the supplementary readings on "Equivalence Relations" and "The Principle of Induction" and Rudin Sections 2.1-14.

4. Recommended but not required: Check that you can figure out the answers to questions 1-9, 12-14, and 16 in the "Sets and Functions" supplementary reading. (You don't need to turn this work in, but doing it will be helpful in making sure you've absorbed the definitions from this week, which are vital to the course.)

5. Let S, T, and V be sets. Prove that $S \cup (T \cap V) = (S \cup T) \cap (S \cup V)$.

6. Do exercises 15, 19, 20, 22, 28, 29, 33(a)and(c), and 34 from the "Sets and Functions" supplementary reading.

Note that several of the exercises above are elementary facts about set theory. The focus of this homework is on writing proofs of these facts. A proof should be (1) correct, in that every statement follows from axioms or what has been proved before, (2) concise, and (3) readable, written out in sentences such that it's clear what the purpose of each step is. There are many good examples in the "Logic and Proof" supplement, as well as in your class notes.