Basic stuff

This week you will need to register for Math 391A. You can register for any section on SPIRE, regardless of time. This is the one-credit Math 300 co-seminar, which consists of a weekly one-hour discussion section with our TA, Haley Schilling. We will schedule three of these discussion sections during the next class meeting and ensure that everyone can make one of them.

The textbook is An Introduction to Mathematical Thinking by Gilbert and Vanstone, possibly supplemented by one or two handouts.

Goals of the course

One of the goals of Math 300 is to learn some of the abstract language and constructions that are useful for many of the 400- and 500-level math courses (e.g., equivalence relations; properties of maps between sets). Another goal is to gain facility in formulating conjectures, in deciding when mathematical statements are true or false, and in learning how to construct proofs of statements (especially via the proof technique of induction). Along the way we will learn some number theory, set theory, combinatorics, and basic logic.

Topics covered, roughly in order

Basic Number Theory (§2.1, 2.2, 2.5); Discussion of Proofs (§1.1, 1.5, 1.6); Logic and Set Theory (§1.2, 1.3, 1.4); Congruences (§3); Proof by induction (§4.1); Binomial Theorem (§4.2); Functions and Bijections (§6.1 - 6.6); Rationals, Reals, Complex Numbers (parts of §5 and §8); and one or two additional topics as time permits.

Grading

There will be weekly problem sets. You are welcome to work with others on the problem sets (and you may consult with me and the TA), but you must ultimately write up your own solutions. There will also be some group work during the discussion sections.

The course will have two midterms and a final exam at the scheduled time. The homework will count for 25%; the discussion section group work counts for 10%; attendance and participation during the lecture counts for 5%; the two midterms, for 35%, split equally; and the final exam, for 25%. I hope to be able to schedule the midterms in the evening so that we can have 90 minutes for each of them.