Test 1 in MATH 405 will take place on Wednesday, February 24. The exam is closed book, and the only permissible aids are your brain and scratch paper. The topics on the exam are chapters 0 - 6.

The exam will have two parts. The first part will be short answer. You may be asked to (formally) state some theorems and definitions. You may be asked to give some examples (or explain why no such examples exist). You may be asked to carry out straightforward applications of theorems. The second part will require you to give several cogent proofs of theorems or results. These may include Lemmas, Theorems, or Corollaries from our text, results from the homework, and results different from these.

Probably the best way to study for Part II of the exam is to prepare well for Part I of the exam: review all class notes, chapters we have covered in the textbook, and homework assignments and solutions. Your proofs will be graded both on mathematical correctness and on presentation so be sure to write clearly, and proofread your solutions.

The following (non-inclusive) list enumerates some of the main definitions and theorems in the course thus far. I do not claim the list is exhaustive, but it does highlight the main points.

1. Definitions of equivalence relation, group, subgroup, group order, order of an element, subgroup generated by an element $a \in G$, subgroups generated by a set of elements, isomorphism, cyclic groups, the division algorithm, dihedral group, the symmetric group, the alternating group, $U(n)$, center of a group, centralizer of an element, $GL(n, F)$, $SL(n, F)$, $Aut(G)$, $Inn(G)$

2. Computational tasks: counting number of elements of given order in cyclic group, finding order of element, finding order of a^k in $\langle a \rangle$, order of elements in permutation groups, even and odd elements and multiplication in S_n, GCD of two integers as a linear combination of these two integers,

3. Fundamental Theorem of Arithmetic, Cayley's Theorem, The Fundamental Theorem of Cyclic Groups, Division Algorithm for $\mathbb{Z}$