## Math F215: Midterm Exam Study Ideas

This list is intended as the start of a study guide. There is no guarantee that because a topic is listed here that it will be on the midterm, or that this is a comprehensive list of topics to appear. The material covered will be everything in the course up to and including Chapter 4 Section 2.

- Know the definition of the statement  $a \mid b$ .
- Know the definition of the statement  $a \equiv b \pmod{n}$ .
- Be able to prove basic theorems involving pairity, divisiblity, and congruence using direct proofs, proofs by contrapositive, and proofs by cases.
- Know the definitions of basic set operations and relations (subsets, intersections, unions, cartesian products, etc.).
- Know the meaning of the symbols  $\bigcap_{\alpha \in A} S_{\alpha}$  (see section 1.5)
- Know what a statement is.
- Be able to negate a statement, and take the conjuction and disjunction of statements.
- Given an implication, be able to state its converse and its contrapositive.
- Be able to convert between logical statements and well written English.
- Be able to use truth tables.
- Be able to show the logical equivalence of two compound statements.
- Know the definition of the implication and the biconditional.
- Know how to distribute a negation over a disjunction, a conjunction, and the qualifiers "for every" and "there exists".
- Know the difference between a trival and a vacuous proof.
- Given a proof, determine what the statement of the result is.
- Given a proof with a mistake in it, determine the mistake.

Good luck!