

**Math 347. Information on final exam. Prof. Ahlgren. Spring 2008.**

- (1) The final exam is cumulative.
- (2) The final is in our classroom. The times are:  
Section C1 (10 am section) : 8-11 am on Tuesday, May 6.  
Section D1 (11 am section): 8-11 am on Saturday, May 3.
- (3) You should know basic definitions.
- (4) You should know statements of basic theorems.
- (5) There will be a number of short answer questions (true-false, proof or counterexample, etc.) which test basic knowledge, knowledge of definitions and theorems.
- (6) You should study old exam questions (especially those you did not know how to do) and homework problems in addition to class notes and the text.
- (7) Please review my record of your grades and let me know if there are any errors before the final exam.
- (8) Office hours.  
Tuesday 10:30-12  
Wednesday 12-1:30  
Thursday TBA. Check web site  
Friday 10-12, 1-2:30  
Monday 11:30-2

**Partial list of topics:**

- (1) Chapter 1: AGM inequality, working with inequalities, functions, set operations, the real number system.
- (2) Chapter 2: Quantifiers, logical statements, the meaning of  $A \implies B$ . Translating statements from English to logical notation and back. Understanding meaning of quantified and logical statements. Negating statements with quantifiers (see first exam). Basic proof techniques.
- (3) Chapter 3: Induction. Know how to write correct proofs using induction. Strong induction and well-ordering property.
- (4) Chapter 4: Bijections, injections, surjections, composition of functions. Know definitions and how to work with examples. Cardinality.
- (5) Chapter 5: Combinatorial reasoning: Know how to count various things. Properties of the binomial coefficient. Proofs using combinatorial reasoning (i.e. counting the same set in two ways to prove an identity).
- (6) Chapter 6: Divisibility. Know definitions and all basic facts. GCD, Euclidean algorithm, solving linear Diophantine equations. Know how to do various types of problems.
- (7) Chapter 7: Modular arithmetic. You should know equivalence relations. Know definitions and basic properties of congruences. Fermat's little theorem. Know how to do various types of problems.
- (8) Chapter 8: Rational numbers. Know basic properties of rational numbers, finding rational points on unit circle, rational root theorem.
- (9) Chapter 13: The real numbers. Completeness axiom, sup and inf, sequences, definition of limit, Monotone Convergence Theorem, basic properties of limits.
- (10) Chapter 14: Sequences. Know basic properties of sequences, limit laws, Cauchy sequences, bounded sequences, proof techniques, etc.