Midterm 1 Review — Math 345

Autumn 2010 — Jim Fowler

This sheet summarizes what sort of content will appear on the midterm. **Calculators are not permitted** and would be useless anyhow.

Possible topics

The first midterm may include material through lecture 12 ("divisibility"). In particular, congruences $a \equiv b \pmod{c}$ and prime numbers will **not** appear on the first midterm (but will definitely appear on future exams!).

- Propositional calculus
- Truth tables
- De Morgan's laws
- Distributive laws
- Tautology
- Proof by contradiction
- Converse of a conditional proposition
- Contrapositives
- Quantifiers
- Bound and free variables
- Nested quantifiers
- Even and odd numbers
- Rational and irrational numbers
- Divisibility

Inspired by the homework

The problems will be inspired by (but exactly the same as) homework problems, so looking back over the homework problems is probably the most efficient way to prepare for the exam.

One big difference, however, is that *most* of the exam problems will present you with a proposition, ask you whether it is true or false, and have you prove it if it true, and provide a counterexample if it is false. This sort of question can be tricky, but I think it forces you to wrestle with the mathematics, which is good.

Problems

There will be five problems on the midterm, each worth **360 points**, for a total of **1800 points**. The **fake midterm** will give you a vague idea of the sorts of problems you might expect, but the fake midterm is much, much longer than the real midterm.