Midterm Review Sheet for Math 300 A, B Spring 2012

The midterm is on Friday, April 27, 2012.

To prepare for the midterm, you should:

- Read our textbook from the beginning through section 3.6. You may also read 3.7 if you like.

- Review all assigned homework. This means going back over every problem which was assigned and thinking through the solutions again. Ideally, you should rework as many problems as possible.

- For graded homework problems, if you did not receive full credit, you should rework the problems into a perfect solution, keeping in mind the comments I made on your work. Check the class website as well for suggestions on the graded problems.

- If any topic is unclear, or you are unable to create a good solution to a problem, you should ask me for help.

On the midterm exam, you might be asked to use any technique, method, or idea which was needed to solve any of the assigned homework problems.

You will need to use the axioms and elementary properties of the real numbers in some proofs, and these will be provided during the exam. In addition, the laws on page 21 and 23 of our textbook will be provided for your use and reference during the exam.

List of topics covered so far in the course

- Statements

    - Logical connectives $(\wedge, \vee, \neg, \rightarrow, \Leftrightarrow)$
    - Truth tables
    - Equivalence and the use of logical laws (e.g., DeMorgan's laws) to show equivalence of statements
    - Equivalence using quantifiers

- Sets

    - Union, intersection and difference of sets
    - The empty set
    - Subsets
    - Power sets
    - Families of sets

- Proofs

    - Direct proofs
    - Proving the contrapositive
    - Proof by contradiction
    - Proofs involving sets, the real numbers, and the integers
    - Proof of an iff statement
    - Proof of a "for all" statement
    - Proof of a "there exists" statement
    - Proofs with "or" statements
    - Uniqueness proofs