Midterm Information

Location: **LINC 100**
Time: **7:00-8:20pm**
Date: **February 28th (2/28)**
What to Bring: **Pencil/Eraser, both sides of a 3x5 inch notecard**
What Not to Bring: Calculators, Headphones, Cellphones(need to be turned off and put away)

Below is a list of topics that will be tested on the second midterm. You should read through the list and make sure that you know and understand the definitions for all terms given as well as study and work through examples of methods or exercises.

- Section 1.8: Proof Methods and Strategy
  - Proof by Cases
  - Exhaustive Proof
  - "Without Loss of Generality"
  - Existence Proof
    - Constructive
    - Nonconstructive
  - Uniqueness Proof
- Section 2.1: Sets
  - Sets, Elements
  - Set Notation
  - Common Sets: $\mathbb{N}$, $\mathbb{Z}$, $\mathbb{Z}^+$, $\mathbb{Q}$, $\mathbb{R}$, $\mathbb{R}^+$,$\mathbb{C}$
  - Closed and Open Intervals
  - Set Equality
  - Subsets, Proper Subsets
  - Empty(Null) Set, Singleton Set
  - Venn Diagrams
  - Cardinality, Finite Set, Infinite Set
  - Power Set
  - Cartesian Product
  - Quantifiers
  - Truth Sets
- Section 2.2: Set Operations
  - Union, Intersection, Difference, Complement
  - Disjoint Sets
- Section 5.1: Mathematical Induction
  - Basis Step, Inductive Step
  - Inductive Hypothesis
- Section 5.2: Strong Induction and Well-Ordering
  - String Induction
  - Well-Ordering Property

- Section 5.3: Recursive Definitions and Structural Induction
    - Recursively-defined Sequences
    - Recursively-defined Sets
    - Basis Step, Recursive Step
    - Exclusion Rule
    - Structural Induction

How to Study

- Review all materials, in particular homework problems and the quiz. These will be the most similar to the exam. Analyze any errors you made on these assignments, so that you know what you did wrong and how to do it right the next time.
- Work on practice problems with friends/classmates – try choosing a problem (odd numbered problems have solutions in the back), then solve it individually before comparing answers and discussing solutions. Quiz each other on definitions or use flash cards.
- Write a page (or two or three) of notes. Go through the list of exam topics and write out definitions and key terms. Explain how to solve types of problems or list some arguments forms. Compare your notes with the lecture notes and the book to see if you missed anything important.
- Ask your instructor (me) and/or your TA any questions you might have. If neither of us is available, try the math tutors in the MLC or the CLC.