Midterm: **Friday, May 2nd**, in class, 50 minutes
You may bring a one-sided 8.5x11 sheet of notes.
Test covers sections 1-9 of the text.

Review sessions: in class **Wednesday** and, optionally, **Thursday (to be announced)**

Study: Sections 1-9 of text (including examples and proofs), class notes, homework problems (both collected and not collected).
Bring questions to reviews or office hours.

Main topics per section:
1. The Language of Mathematics: Statements, Connectives (and, or, not).
2. Implications.
3. Direct Proofs and proof by cases.
4. Proof by contradiction.
5. Induction (skip 5.4 Strong Induction)
6. Sets: elements, ways to define/notation, subsets, empty set, operations on sets (union, intersection, difference), power set of a set, complement of a set.
   Thm 6.3.4: results and how to prove them.
   Know how to prove a set is a subset of another, or that two sets are equal.
   Understand difference between an element and a subset.
7. Quantifiers: universal and existential.
   Understand what they are and how to use them. Understand combinations of more than one quantifier, and negations of such. How to prove and disprove statements involving quantifiers.
   Cartesian product: definition and how to use it.
8. Functions
   Definitions & understand: functions, domain, codomain, image, graph, composition of functions. Be able to come up with examples!
   Be able to formally prove that the limit of a sequence is (or is not) equal to zero.
   Definitions & understand: when a function is injective, surjective, bijective, and invertible. Be able to give examples. Be able to prove injectivity/surjectivity for specific functions.
   Inverse of a function: what it is and how to find it.
   You can skip sections 9.3 and 9.4.

Also: understand inequalities and proofs involving inequalities.

Midterm questions may include computational questions (for instance: truth tables, or function compositions), definitions, multiple choice or Yes/No questions, short questions like “give the converse of the following statement”, finding errors in an argument, short proofs (e.g. set equality, function injectivity), one “serious” proof (which may require direct proof, proof by contradiction, or proof by induction).