Math 2001. Topics for Midterm 1

You should master the following topics for Midterm 1.

(1) Notation for sets, including the set-builder notation.

(2) The difference between the notations $\in$ and $\subseteq$.

(3) Definition of Cartesian products and power sets of sets, and how to count them.

(4) Definition of complements of sets.

(5) Visualizing sets (including unions, intersections and complements) using Venn diagrams.

(6) Notation for indexed sets.

(7) Truth tables for "and", "or", "not", conditional, and biconditional statements.

(8) DeMorgan's Law.

(9) Using truth tables to prove two statements are or are not logically equivalent.

(10) Notation for quantifiers.

(11) The multiplication, addition and subtraction principles for counting.

(12) Counting problems involving permutations and combinations, including problems requiring the bars-and-stars method and the word problem (see the two worksheets on counting.)

(13) The binomial theorem and its applications.

(14) Statements and applications of the inclusion-exclusion principle for two or three sets.

(15) Statements and applications of the pigeonhole and division principles.