Math 102
Exam 1 Review Sheet

Section 1.1 Problem Solving

Key Topics:
• Memorize the 7 problem solving strategies and be able to apply these strategies to a specific problem.
• Know what a counterexample is and how to use one to disprove a mathematical statement.

Section 1.2 Estimation

Key Topics:
• Understand rounding and compatible numbers and be able to make estimates based on percentages.
• Be able to tell whether an estimate is an over-estimate or an under-estimate.

Section 1.3 The Language of Sets

Key Topics:
• The definition of a set and how to represent a set in both set-builder and roster notation.
• Understand the ides of well definedness and be able to determine whether a given set is well defined.
• Memorize the common numerical sets (natural numbers, whole numbers, integers, etc.)
• Understand the concepts of universal sets, the empty set, and sets of sets.
• Understand the notation: $\in$, $\notin$, and the cardinal number of a set: $n(A)$

Section 1.4 Comparing Sets

Key Topics:
• Know the definitions of equality of sets and equivalence of sets and understand subsets and proper subsets.
• Be able to count the subsets of a set and be able to use Pascal's Triangle to find the number of subsets of a given size.

Section 1.5 and 1.6 Set Operations and Survey Problems

Key Topics:
• Understand the be able to apply the set operations: union, intersection, difference, and compliment.
• Know the definition of disjoint sets and memorize De Morgan's Laws.
• Be able to draw and use Venn diagrams and be able to count the number of elements in the union of two sets.
• Be able to understand descriptions of sets using multiple set operations;
• Be able illustrate combinations of set operations by shading regions of a Venn diagram.
• Be able to describe combinations of regions in a Venn diagram using set operations.
• Be able to organize and interpret survey information using sets and Venn diagrams.

Section 2.1: Inductive and Deductive Reasoning

Key Topics:
• Know the definitions of inductive and deductive reasoning.
• Be able to identify which of the two is being used in a given example.
• Be able to use inductive reasoning to make conjectures and deductive reasoning to do a simple proof.

Section 2.2: Statements, Connectives and Quantifiers

Key Topics:
• Know the definition of a statement, and the difference between simple and compound statements.
• Be able to determine whether or not an English sentence is logical statement.
• Know the symbols for and meanings of the 5 basic logical operations.
• Be able to translate from English statements to logical symbols and vice versa.

Practice Exam: Chapter Test page 68 # 1, 4, 5, 7, 9, 10, 12, 14, 17, 18, 19, 21
Chapter Test page 135-136 # 1, 2, 4, 5, 6, 7, 8