

**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 ideas 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 Problems: 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**