

Math 251

Assignment 6

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All exercises can be found in the book of Kenneth
Rosen, seventh edition.

1. Prove ALL set identities in Table 1.
2. Draw the Venn diagrams for each of these combinations of the sets A , B and C .
 - (a) $A \cap (B - C)$.
 - (b) $(A \cap B) \cup (A \cap C)$.
 - (c) $(A \cap \bar{A}) \cup (A \cap \bar{C})$.
3. What can you say about the sets A and B if we know that:
 - (a) $A \cap B = A$?
 - (b) $A \cap B = A$?
 - (c) $A - B = A$?
4. Find $\bigcup_{i=1}^{\infty} A_i$ and $\bigcap_{i=1}^{\infty} A_i$ if for every positive integer i ,
 - (a) $A_i = [-i, -i + 1, \dots, -1, 0, 1, \dots, i - 1, i]$.
 - (b) $A_i = [-i, i]$.
 - (c) $A_i = [-i, i]$, that is the set of real numbers x with $-i \leq x \leq i$.
 - (d) $A_i = [i, \infty)$, that is the set of real numbers x with $x \geq i$.
5. The **successor** of the set A is the set $A \cup \{A\}$. Find the successor of the following sets.
 - (a) $\{1, 2, 3\}$.
 - (b) \emptyset .
 - (c) $\{\emptyset\}$.
 - (d) $\{\emptyset, \{\emptyset\}\}$.