Beginning Activities for Section 5.1

Mathematical Reasoning: Writing and Proof, Version 3

Beginning Activity 1 (Set Operations)

The examples used in this beginning activity were meant to provide a better understanding of the definitions of set intersection, set union, and set difference. Please note that the correct use of the roster method to describe the sets.

1. $A \cup B = \{0, 1, 2, 3, 4, 5, 6, 9\}$.

2. $A^c = \{4, 5, 6, 7, 8, 10\}$.

3. $B^c = \{0, 1, 7, 8, 9, 10\}$.

4. $A \cup B^c = \{0, 1, 2, 3, 7, 8, 9, 10\}$.

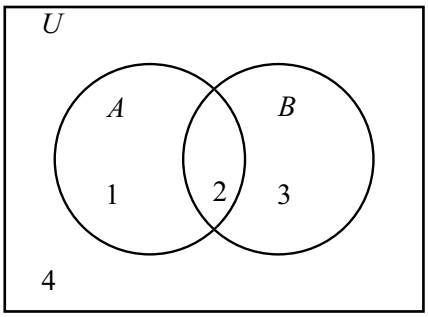
5. $A^c \cap B^c = \{7, 8, 10\}$.

6. $A^c \cup B^c = \{0, 1, 4, 5, 6, 7, 8, 9, 10\}$.

7. $(A \cap B)^c = \{0, 1, 4, 5, 6, 7, 8, 9, 10\}$.

Beginning Activity 2 (Venn Diagrams for Two Sets)

Venn diagrams are frequently used in mathematics to explore relationships between sets, and in some situations, to provide counterexamples for false propositions.



1. For the set A^c, regions 3 and 4 are shaded.

2. For the set B^c, regions 1 and 4 are shaded.

3. For the set $A^c \cup B$, regions 2, 3, and 4 are shaded.

4. For the set $A^c \cup B^c$, regions 1, 3, and 4 are shaded.

5. For the set $(A \cap B)^c$, regions 1, 3, and 4 are shaded.

6. For the set $(A \cup B) - (A \cap B)$, regions 1, and 3 are shaded.
