Math 116: Written Homework Set 8

This assignment is due on Thursday, November 2nd in class. Show all work where possible! Answers magically appearing will receive no credit.

1. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{2, 4, 6\}$, $B = \{1, 2, 5, 8\}$, $C = \{1, 3, 7\}$.
   Find each of the following.
   a. $A \cup B$
   b. $A \cap B$
   c. $A \cap (B \cup C)$
   d. $A' \cup C$
   e. $A \cap C'$
   f. $(A \cup C') \cap (B \cup A')$

2. Draw a Venn diagram to show each of the following sets.
   a. $A \cap B'$
   b. $(A \cap B)'$
   c. $A \cap (B \cup C')$
   d. $A \cap (B' \cap C)$

3. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{2, 4, 6\}$, $B = \{1, 2, 5, 8\}$, $C = \{1, 3, 7\}$.
   Find each of the following.
   a. $n(A)$
   b. $n(B)$
   c. $n(C)$
   d. $n(A \cup B)$
   e. $n(A \cap B)$
   f. $n(A) + n(B)$

4. For the sets specified in problem 3, verify that

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

5. If $n(A) = 640$, $n(B) = 280$, and $n(A \cup B) = 765$, find $n(A \cap B)$.

Selected Answers

1. a. $\{1, 2, 4, 5, 6, 8\}$
   c. $\{2\}$
   e. $\{2, 4, 6\}$

2. a. Sketch a Venn diagram with region **I** shaded.
   c. Sketch a Venn diagram with regions **I**, **II**, and **V** shaded.

3. a. 3
   c. 3
   e. 1

5. 155