

Math 116: Written Homework Set 8

This assignment is due on Monday, November 7th 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. $A \cup B$ | d. $A' \cup C$ |
| b. $A \cap B$ | e. $A \cap C'$ |
| c. $A \cap (B \cup C)$ | f. $(A \cup C') \cap (B \cup A')$ |

2. Draw a Venn diagram to show each of the following sets.

- | | |
|------------------|-------------------------|
| a. $A \cap B'$ | c. $A \cap (B \cup C')$ |
| b. $(A \cap B)'$ | 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. $n(A)$ | d. $n(A \cup B)$ |
| b. $n(B)$ | e. $n(A \cap B)$ |
| c. $n(C)$ | 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