Math 302 , Problem Set 2 Due January 30,2025 6 P.M.

Draw a Venn diagram corresponding to the following logical conditions.

1.
$$A \implies B.$$

2.
$$A \iff B.$$

3.
$$\neg A \wedge \neg B.$$

Give formal proofs of the following (with A, B, C sets).

4. If $A \subset B$ then $A \cup B = B$.

5. If $A \subset B$ then $B^c \subset A^c$.

6. If $A \subset B$ then $B \backslash (B \backslash A) = A$.

7. $A \subset B \cap C$ if and only if $A \subset B$ and $A \subset C$.

8.
$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C).$$

9.
$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C).$$

10.
$$A = (A \cap B) \cup (A \backslash B).$$