SET LAB

CS-113

2024/02/29

Exercise 1. Let A and B be two sets. Show that $A \cup B = A \cap B$ if and only if $A = B$.

Exercise 2. Suppose that $A \subset X$ and $B \subset X$ given that X is a set. Show that the following are true. $A \cap B^C = \emptyset$ and $A^C \cap B = \emptyset$ if and only if $A = B$

Exercise 3. Give an example of a set X having two subsets, A and B, satisfying:

$$X - (A \cap B) \neq (X - A) \cap (X - B)$$

Exercise 4. Define, for each two sets A, B: $A \Delta B = (A - B) \cup (B - A)$.

- Let $A = \{1, 3, 4\}$, $B = \{1, 5, 7\}$. Write out the set $A \Delta B$.
- Write out the set $\mathcal{P}(A) \Delta \mathcal{P}(B)$.