

Math 251: Foundations of Advanced Mathematics

Written Problems #3

Let A and B be sets, and let $\{A_i\}_{i \in I}$ be a family of sets. Prove the following statements.

1. (Set Identities Handout #19) $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$.

(This set is called the *symmetric difference* of A and B and denoted $A \Delta B$.)

2. $A \subseteq B$ if and only if $\mathcal{P}(A) \subseteq \mathcal{P}(B)$.

3.
$$\left(\bigcup_{i \in I} A_i \right)^c = \bigcap_{i \in I} A_i^c.$$