

Homework Five

1. Prove that $A \times \emptyset = \emptyset$
2. Prove that $\overline{\bigcap_{i \in I} A_i} = \bigcup_{i \in I} \overline{A_i}$.
3. Grade the following proof:

Proposition 1. *Let A and B be sets. Then $A \times B = B \times A$.*

Proof. Let $(a, b) \in A \times B$. Then $a \in A$ and $b \in B$. Thus $(b, a) \in B \times A$ and $A \times B \subseteq B \times A$.

Conversely let $(b, a) \in B \times A$. Then $b \in B$ and $a \in A$. Thus $(a, b) \in A \times B$ and $B \times A \subseteq A \times B$. \square