

Theorem (2.2.11a). *Let A and B be sets. The union of A and B is commutative.*

Proof. Let x be an element in $A \cup B$. This is defined as $(x \in A) \vee (x \in B)$. Because logical disjunction is commutative
 $(x \in A) \vee (x \in B) \equiv (x \in B) \vee (x \in A)$. This of course means $x \in (B \cup A)$. Therefore $A \cup B = B \cup A$, and the union of two sets is indeed commutative. ■