Definition: Cardinality of Disjoint Union

Suppose A and B are disjoint finite sets, then:

$$|A \cup B| = |A| + |B|$$

Proof

From the the cardinality of a finite union, we have

$$|A \cup B| = |A| + |B| - |A \cap B|$$

but A and B are disjoint, therefore $A \cap B = \varnothing$ so $|A \cap B| = 0$ so we have

$$|A \cup B| = |A| + |B|$$

as needed ■