Countability
Cardinality and Countability

**Definition:** Two sets $A$ and $B$ have the *same cardinality* if there is a one-to-one correspondence between elements in $A$ and $B$; in other words, if there is a bijection from $A$ to $B$.

**Definition:** A set that is either finite, or has the same cardinality as the set of positive integers $\mathbb{Z}^+$ is called *countable*. A set that is not countable is called *uncountable*.

**Theorem:** The set of integers is countable.

**Theorem:** The set of positive rational numbers is countable.

**Theorem:** The set of real numbers is uncountable.