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.