Cardinality

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Cardinality

Comparing cardinalities. Instead of defining cardinality as absolute, think of it as a relation between sets.

Defn. Two sets S, T have the same cardinality if there exists a bijection $f: S \to T$ between the two functions.

Ex. Sets $A = [0, 1]$ and $B = [0, 2]$

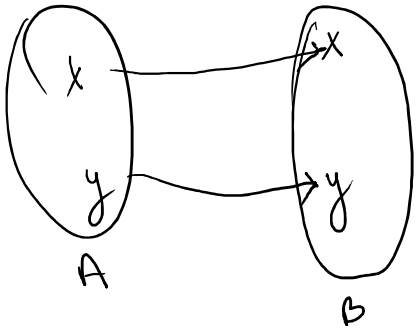
$f(x): A \to B \quad = 2x$ is a bijection!

$\Rightarrow |A| = |B|$

$\Rightarrow |[0, k]| = |[0, 1]|$ for any k

To prove, show function, injection, surjection

Properties of cardinality



Theorem For any set A, we have $|A| = |A|$.

Theorem If A, B, C are sets where $|A| = |B|$ and $|B| = |C|$, then $|A| = |C|$