

0.1 Cardinality

0.1.1 Cardinality of finite sets

The cardinality of a set s is shown as $|s|$. It is the number of elements in the set. We define it formally below.

0.1.2 Injectives, surjectives and bijectives

Consider 2 sets. If there is an injective from a to b then for every element in a there is a unique element in b .

If this injective exists then we say $|a| \leq |b|$.

Similarly, if there is a surjective, that is for every element in b there is a unique element in a , then $|a| \geq |b|$.

Therefore, if there is a bijection, $|a| = |b|$, and if there is only an injective or a surjective then $|a| < |b|$ or $|a| > |b|$ respectively.

0.1.3 Cardinality as a function

Every set has a cardinality. As a result cardinality cannot be a well-defined function, for the same reason there is no set of all sets.

Cardinality functions can be defined on subsets.