Injections, Surjections, Bijections

A function $f : A \to B$ ("from A to B") is:

- ***surjective*** if every element of B is assigned to at least one element of A. More concisely, f is surjective iff $f(A) = B$ (that is, if the range of f is the codomain of f).
- ***injective*** if every element of B is mapped *at most once*, and
- ***bijective*** if it is surjective and injective.

Given any two sets A and B, we say that:

- $|A| \geq |B|$ iff there is a surjection from A to B
- $|A| \leq |B|$ iff there is an injection from A to B
- $|A| = |B|$ iff there is a bijection between A and B