Glossary

Mapping

A function with domain P and range Q is called a *mapping* or map from P to Q, written $\delta{:}P\to Q$; if, for example, for all $p \in P$ the function maps p onto p^2, this can be specified by using the notation $\delta{:}p\mapsto p^2$.

Injection (one-one, injective function)

An *injection* from a set P to a set Q is a one-to-one function whose domain is P and whose range is PART of Q. For example, if $P = \{3,6\}$ and $Q = \{9,36,150\}$, then $\delta{:}p\mapsto p^2$ is an injection.

Surjection (onto, surjective function)

A *surjection* from a set P to a set Q is a function whose domain is P and whose range is the WHOLE of Q. For example, if $P = \{2, -2, 3\}$ and $Q = \{4, 9\}$, then $\delta{:}p\mapsto p^2$ is a surjection.

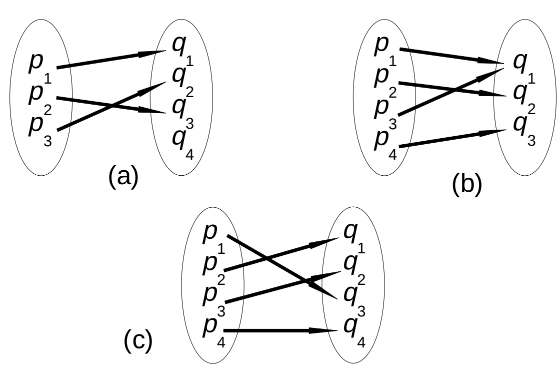
Bijection (one-one and onto, bijective function)

A mapping $\delta{:}P\to Q$, where P,Q are sets satisfying the properties

(1) if $p,q \in X$ and $\delta(p) = \delta(q)$ then $p = q$
(2) if $q \in Q$ then $q = \delta(p)$ for some $p \in P$.

Any bijection has an inverse mapping δ^{-1} such that $\delta(\delta^{-1}(q)) = q$ and $\delta(\delta^{-1}(p)) = p$ for all $p \in P$ and $q \in Q$; conversely any mapping δ having such an inverse must be a bijection.

A bijection from a set P to a set Q is a function that is both an injection and a surjection.



(a) Injective, (b) surjective and (c) bijective functions.