

Functions

1 Why

We want a notion for a correspondence between two sets.

2 Definition

A functional relation on two sets relates each element of the first set with a unique element of the second set. A function is a functional relation.

The domain of the function is the first set and codomain of the function is the second set. The function maps elements from the domain to the codomain. We call the codomain element associated with the domain element the result of applying the function to the domain element.

2.1 Notation

Let A and B be sets. If A is the domain and B the codomain, we denote the set of functions from A to B by $A \to B$, read aloud as "A to B".

We denote functions by lower case latin letters, especially f, g, and h. The letter f is a mnemonic for function; g and h follow f in the Latin alphabet. We denote that $f \in A \to B$ by $f: A \to B$, read aloud as "f from A to B".

Let $f: A \to B$. For each element $a \in A$, we denote the result of applying f to a by f(a), read aloud "f of a." We sometimes drop the parentheses, and write the result as f_a , read aloud as "f sub a." The set $\{(a, f(a)) \in A \times B \mid a \in A\}$ of ordered pairs is the graph of f.

Let $g: A \times B \to C$. We often write g(a,b) or g_{ab} instead of g((a,b)). We read g(a,b) aloud as "g of a and b". We read g_{ab} aloud as "g sub a b."