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0.1 Injective, bijective and surjective functions

0.1.1 Injective functions

$f(a) = f(b) \to a = b$

0.1.2 Surjective functions

All points in codomain have at least one matching point in domain

Mapping info, details

0.1.3 Bijective

Both injective and surjective

0.1.4 Other

___Identity function___

The identity function maps a term to itself.

___Idempotent___

An idempotent function is a function which does not change the term if the function is used more than once. An example is multiplying by 0.

0.1.5 Inverse functions

An inverse function of a function is one which maps back onto the original value.

$g(x)$ is an inverse function of $f(x)$ if

$g(f(x)) = x$

0.1.6 Properties of binary functions

Binary functions can be written as:

$f(a, b) = a \oplus b$

A function is commutative if:

$x \oplus y = y \oplus x$

A function is associative if:

$(x \oplus y) \oplus z = x \oplus (y \oplus z)$

A function $\otimes$ is left distributive over $\oplus$ if:

$x \otimes (y \oplus z) = (x \otimes y) \oplus (x \otimes z)$

Alternatively, function $\otimes$ is right distributive over $\oplus$ if:

$(x \oplus y) \otimes z = (x \otimes z) \oplus (y \oplus z)$

A function is distributive over another function if it both left and right distributive over it.