0.1 Domains and ranges

0.1.1 Domain

All values on which the function can be called

$\forall x(f(x) = y) \rightarrow P(y))$

0.1.2 Image

$\forall x((\exists y f(x) = y) \rightarrow P(y))$

Outputs of a function.

AKA: Range

The image of x is $f(x)$.

0.1.3 Preimage

The preimage of y is all x where $f(x) = y$.

0.1.4 Codomain

Sometimes the image is a subset of another set. For example a function may map onto natural numbers above 0. Natural numbers above 0 would be the image, and the natural numbers would be the codomain.

0.1.5 Example

$f(n) = s(n)$

Domain is: $\mathbb{N}$

Codomain is also: $\mathbb{N}$

Image is $\mathbb{N} \wedge n \neq 0$

0.1.6 Describing functions

If function f maps from set X to set Y we can write this as:

$f : X \rightarrow Y$