

Inverse functions

The inverse function maps the range back to the domain. For e.g.

$$f(x)$$

x	1	2	3	4
y	2	3	4	5

$$f^{-1}(x)$$

x	2	3	4	5
y	1	2	3	4

It basically reverses the values.

Inverse functions only exist for one-to-one functions because a many-to-one function would have a one-to-many inverse, which is not considered a function.

On the graph, the inverse function is the normal function mirrored on the line $y = x$.

To find the inverse function for $f(x) = x + 1$ (works for any),

$$y = x + 1$$

Flip

$$x = y + 1$$

Solve for y

$$y = x - 1$$

This is the inverse

$$f^{-1}(x) = x - 1$$