1 | What is a function?

A function $f : D \to C$ is a unary operation that takes every element in the domain D to exactly one element in the codomain C.

$f(x) = x^2$ is a function over the domain of reals.

2 | A 1:1 function or injective function

A bijective function is a function f for which there exists a function g such that $g\left(f(x)\right) = x$ for all $x \in D$. For every input, there is exactly one output, and for every output, there is exactly one input.

$f(x) = x^2$ is not a 1:1 function, because both $-1^2 = 1$ and $1^2 = 1$.

3 | What is an inverse function

An inverse function $g : C \to D$ is a function such that $g(f(x)) = x$ and $f(g(x)) = x$

There is no true inverse for $f(x) = x^2$, because it is not bijective.

4 | How are the graphs related

The graph of an inverse function is reflected about $y = x$.