$$f : \mathbf{R} \to \mathbf{R} \qquad g : [0,\infty) \to \mathbf{R} \qquad h : [0,\infty) \to [0,\infty)$$
$$f(x) = x^2 \qquad g(x) = x^2 \qquad h(x) = x^2$$

$1:1$
$x_1 \neq x_2$
then
$f(x_1) \neq f(x_2)$

not $1:1$
there exists
$x_1 \neq x_2$
such that
$f(x_1) = f(x_2)$

onto
range $=$ *codomain*

not onto
range $\neq$ *codomain*

invertible

Defn: Suppose $f : A \to B$ is 1:1 function where $A =$ domain, $B =$ range, then its inverse function $f^{-1} : B \to A$ exists and is defined by

$$f^{-1}(b) = a \text{ if and only if } f(a) = b.$$