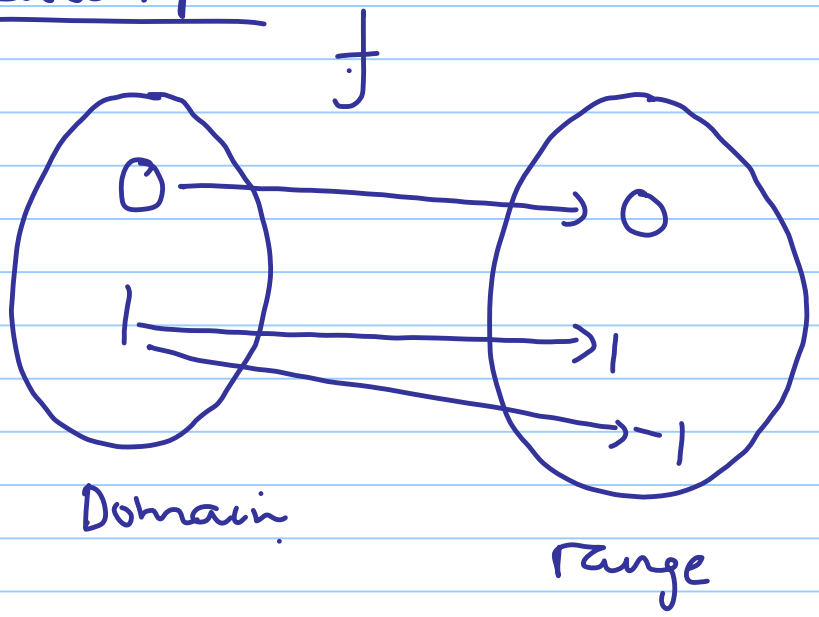
September 28, 2010

Note Title 9/28/2010

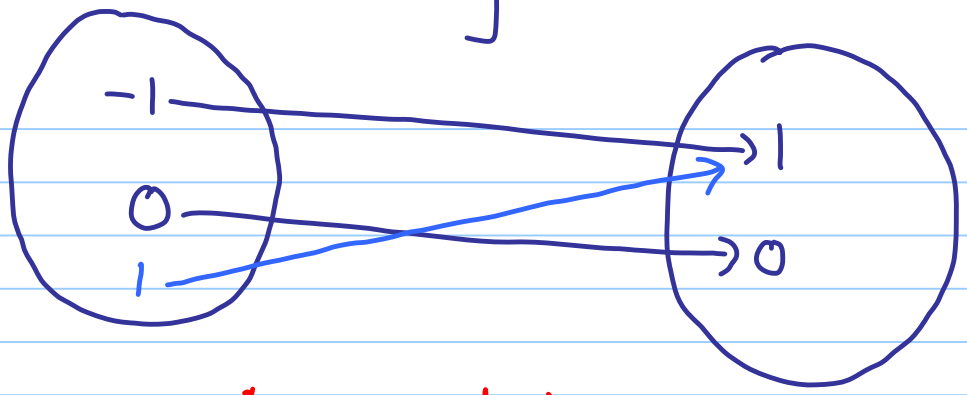
3.5 One-to-one functions

Example



Not a function

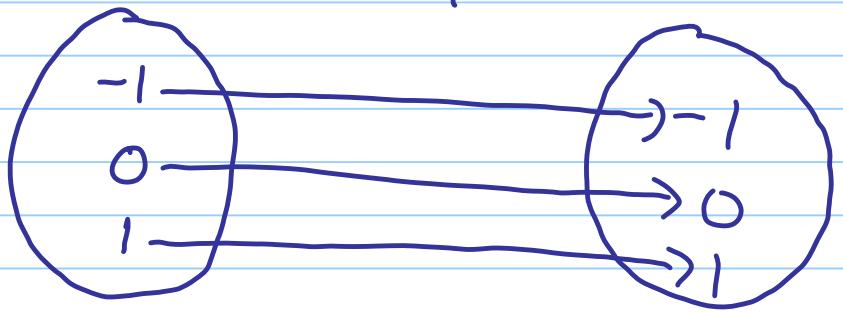
g



A function

Not one to one

h

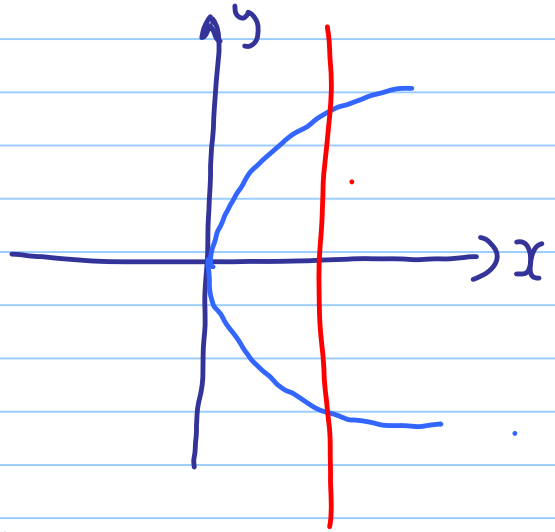


h is a function.

one to one

Example

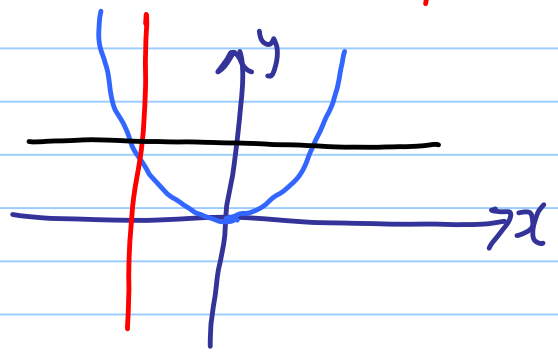
$x = y^2$



By vertical line test

NOT a function.

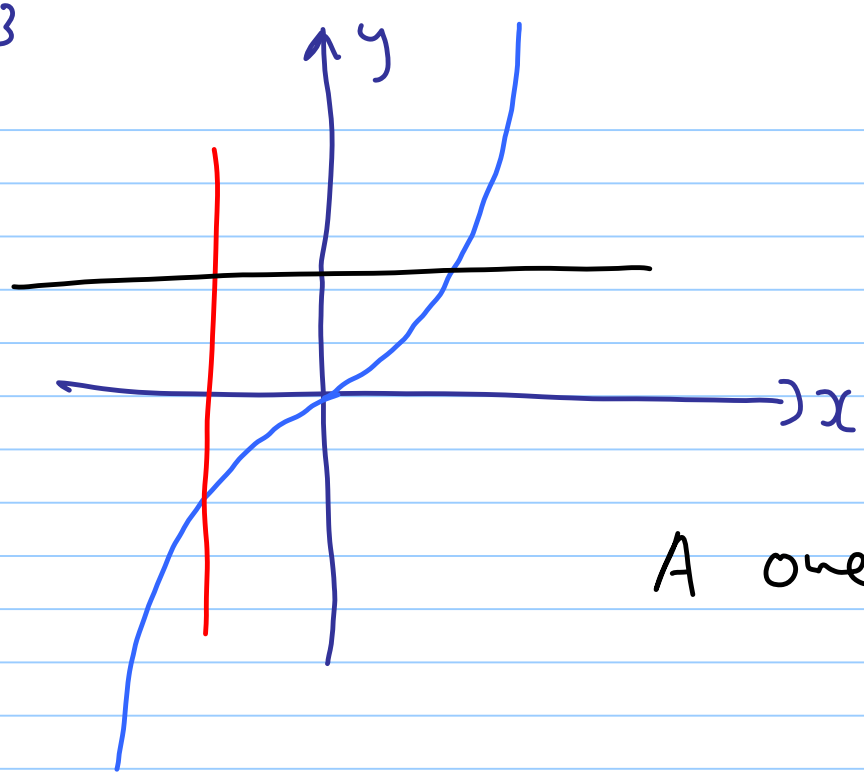
$y = x^2$



A function

Not one to one (Horizontal line test!)

$y = x^3$



A function

One-to-one.

A one-to-one function.

Example

$f(x) = 5x^3 - 2$ one-to-one?

$x_1 \neq x_2 \Rightarrow f(x_1) \neq f(x_2)$

Same as

$f(x_1) = f(x_2) \Rightarrow x_1 = x_2$

Let

$5x_1^3 - 2 = 5x_2^3 - 2$

$5x_1^3 = 5x_2^3$ (add 2)

$x_1^3 = x_2^3$ (divide by 5^-)

$(x_1^3)^{1/3} = (x_2^3)^{1/3}$ Take Cube root

$\boxed{x_1 = x_2}$ One-to one.