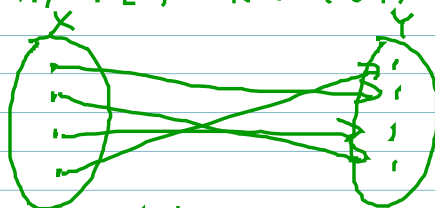
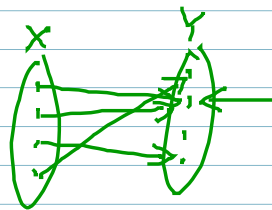


One-to-one function

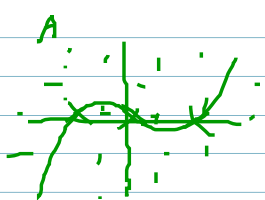
If $x_1 \neq x_2$, Then $f(x_1) \neq f(x_2)$



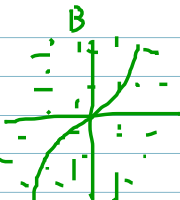
1-1



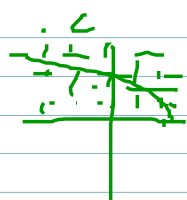
NOT 1-1



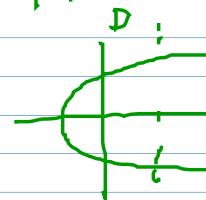
Function



1-1 Function



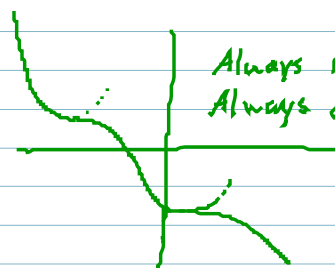
1-1 Function



NOT Function

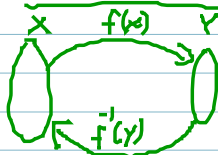
x	y
-2	3
-1	7 ←
0	-9
1	5
2	7 ←

Function



Always increase
Always decrease

~~DEF~~ Inverse Function - $f^{-1}(x) \neq \frac{1}{f(x)}$



$$D_f = R_{f^{-1}}$$

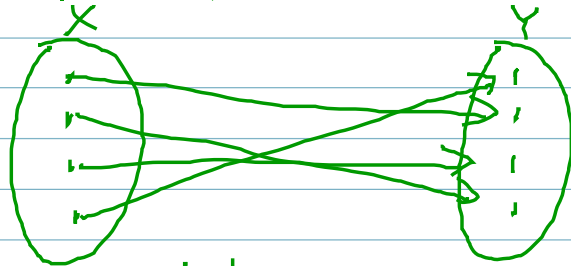
$$R_f = D_{f^{-1}}$$

$$f^{-1}(f(x)) = f^{-1}(y) = x \quad \rightarrow \quad f^{-1}(f(x)) = x, \quad x \in D_f$$

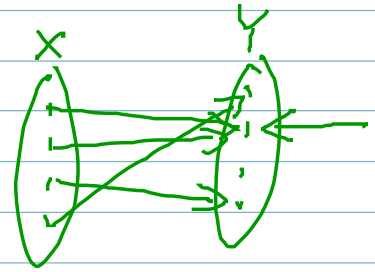
$$f(f^{-1}(y)) = f(x) = y \quad \rightarrow \quad f(f^{-1}(x)) = x, \quad x \in D_{f^{-1}}$$

One-to-one function

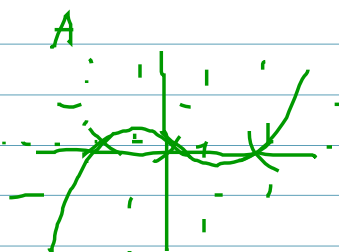
If $x_1 \neq x_2$, Then $f(x_1) \neq f(x_2)$



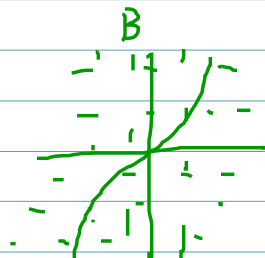
1-1



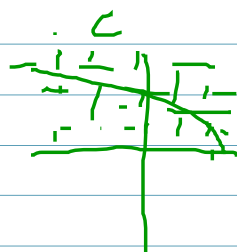
NOT 1-1



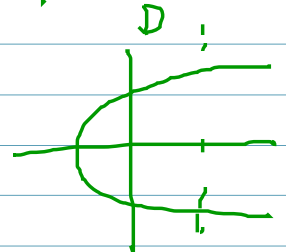
Function



1-1 Function



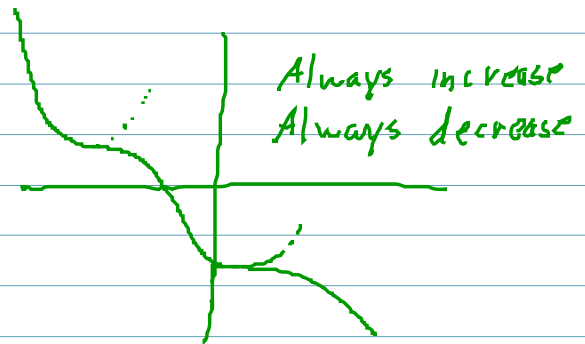
1-1 Function



NOT Function

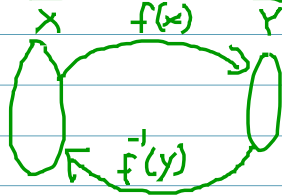
x	y
-2	3
-1	7 ←
0	-9
1	5
2	7 ←

Function



Always increase
Always decrease

~~DEF~~ Inverse Function - $f^{-1}(x) \neq \frac{1}{f(x)}$



$$D_f = R_{f^{-1}}$$

$$R_f = D_{f^{-1}}$$

$$f^{-1}(f(x)) = f^{-1}(y) = x \quad \rightarrow \quad f^{-1}(f(x)) = x, \quad x \in D_f$$

$$f(f^{-1}(y)) = f(x) = y \quad \rightarrow \quad f(f^{-1}(x)) = x, \quad x \in D_{f^{-1}}$$

$$f(x) = 2x - 5$$

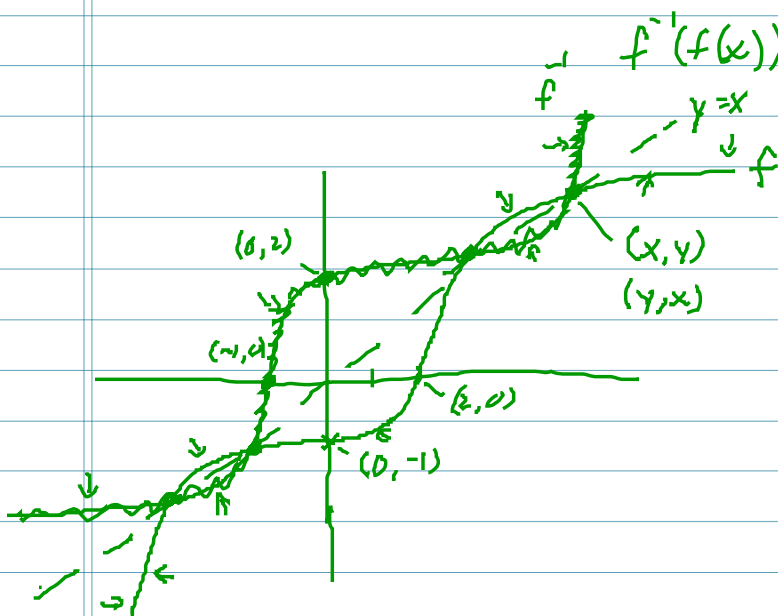
$$f^{-1}(x) = \frac{x+5}{2}$$

$$f(f^{-1}(x)) = f\left(\frac{x+5}{2}\right) = 2\left(\frac{x+5}{2}\right) - 5$$

$$= x + 5 - 5 = x$$

$$f^{-1}(f(x)) = f^{-1}(2x-5) = \frac{2x-5+5}{2}$$

$$= \frac{2x}{2} = x$$



$$f(x) = 2x - 5$$

$$y = 2x - 5$$

$$x = \frac{y+5}{2}$$

$$\frac{y+5}{2} = f^{-1}(y)$$

$$f(x) = \frac{3x-7}{4x+5} = y$$

$$(4x+5)y = 3x-7$$

$$4xy + 5y = 3x - 7$$

$$4xy - 3x = -5y - 7$$

$$x(4y-3) = -5y-7$$

$$x = \frac{-5y-7}{4y-3} = f^{-1}(y)$$

$$f(x) = x^2 = y$$

$$y^2 = x$$

$$y = \pm\sqrt{x}$$

$$x \geq 0$$

