

Example 2: If $(2, 3)$ is a member of $f(x)$, name an element of the inverse of $f(x)$ aka $f^{-1}(x)$.

Answer $(3, 2)$

Ex 5 Finding Inverses

(a) $f(x) = 2x + 5$ Graphs as a line, \therefore it is one-to-one.



$$f(x) = 2x + 5 \quad \text{(1) replace } f(x) \text{ w/ } y$$

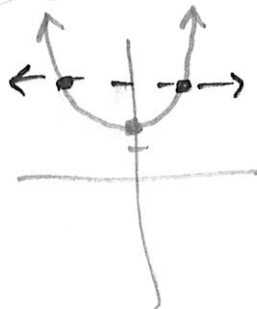
$$y = 2x + 5 \quad \text{(2) Solve for } x$$

$$\frac{y - 5}{2} = \frac{2x}{2} \Rightarrow x = \frac{y - 5}{2}$$

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

(3) Replace x with $f^{-1}(x)$
Replace y with x

(b) $y = x^2 + 2$



Does not pass horizontal line test.

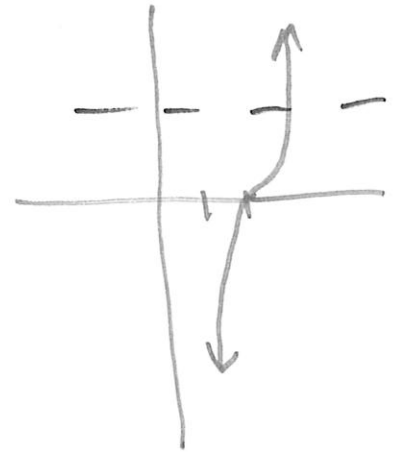
NOT one-to-one

No Inverse

Ex 5 (c) $f(x) = (x-2)^3$

Passes HLT

∴ One-to-one and has an inverse.



$$\sqrt[3]{y} = \sqrt[3]{(x-2)^3} \quad (1)$$

$$\sqrt[3]{y} = x - 2 \quad (2)$$

$$\sqrt[3]{y} + 2 = x$$

$f^{-1}(x) = \sqrt[3]{x} + 2$ (3)

Ex 6 Inverse of Rational Function

$$f(x) = \frac{2x+3}{x-4} \quad x \neq 4$$

(1) $(x-4)y = \frac{2x+3}{x-4} (x-4)$

(2) $y(x-4) = 2x+3$
 $-2x + 4y = 2x + 3$

$$yx - 2x = 4y + 3$$

$$x(y-2) = \frac{4y+3}{y-2}$$

$x = \frac{4y+3}{y-2}$

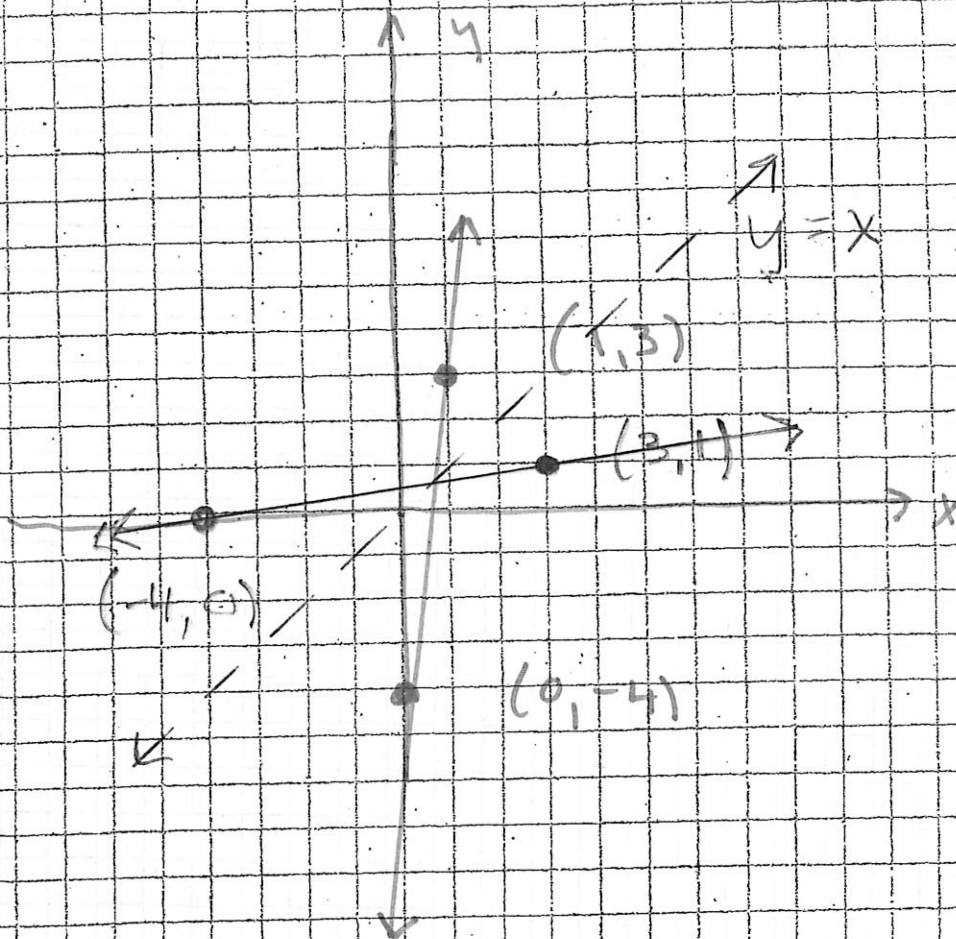
(3) $f^{-1}(x) = \frac{4x+3}{x-2}$

$x \neq 2$

4.1

Ex 7

Graphing f^{-1} from f graph



$f(x)$ and $f^{-1}(x)$ are reflections
across $y = x$.