

Trig 3.4

$$\begin{array}{cc} f(x) & (a,b) \\ f^{-1}(x) & (b,a) \end{array} \quad \textcircled{y=x}$$

Determine inverses of
relations and functions

whiteboards
Quiz 3.3-3.4 tomorrow

Graphs functions and their

Inverse Relations

Two relations are inverse relations if and only if one relation contains the element (b, a) whenever the other relation contains the element (a, b) .

domain

range

$$f(x) \text{ \& } f^{-1}(x)$$

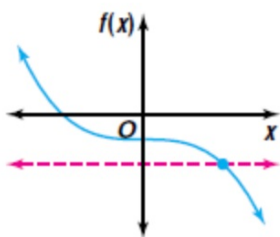
line of symmetry ($y=x$)

inverse function/ inverse
relation

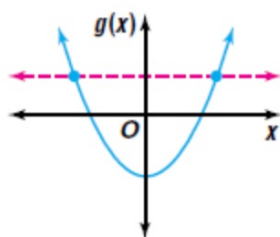
vertical line test (VLT)

horizontal line test (HIT)

is f a function?
is f^{-1} a fn?



The inverse of $f(x)$ is a function.



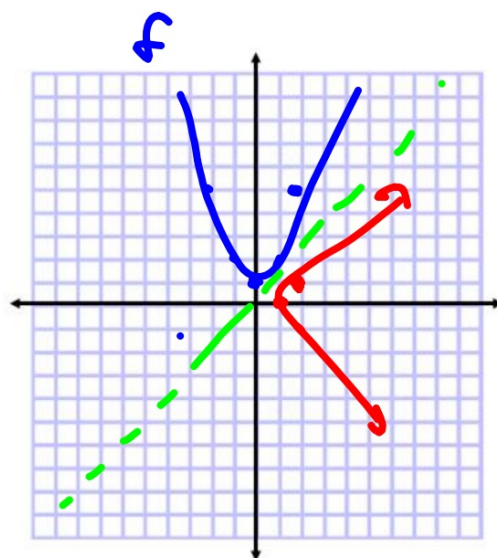
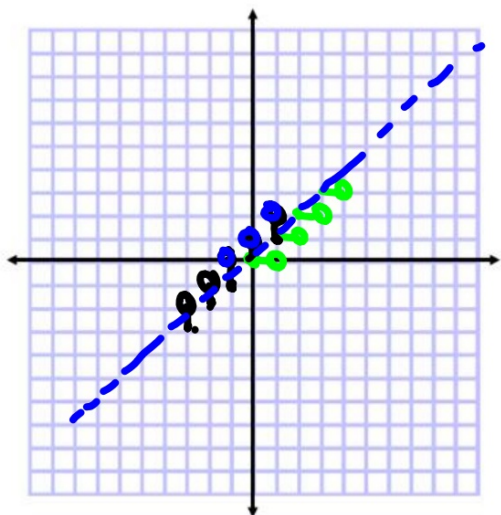
The inverse of $g(x)$ is not a function.

Reminder (a,b) ... (b,a) reflect $y=x$. 

Lesson 3-4 (Pages 152-158)

Graph each function and its inverse.

2. $f(x) = x^2 + 1$



Equation

VLT, HLT

Find $f^{-1}(x)$. Then state whether $f^{-1}(x)$ is a function.

4. $f(x) = 4x - 5$

5. $f(y) = -2x + 2$

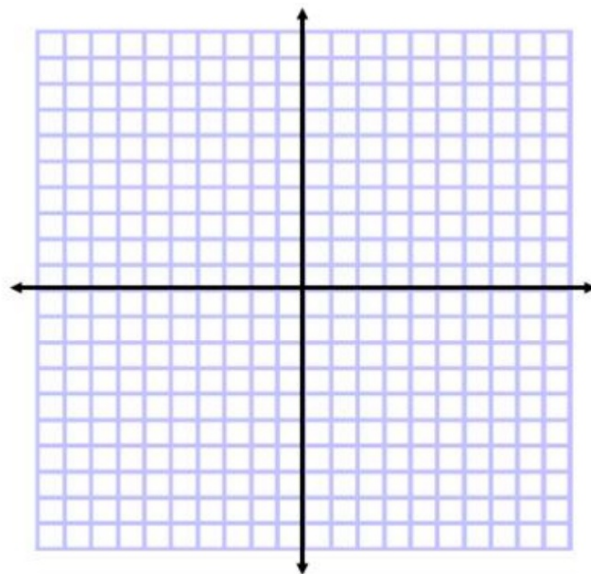
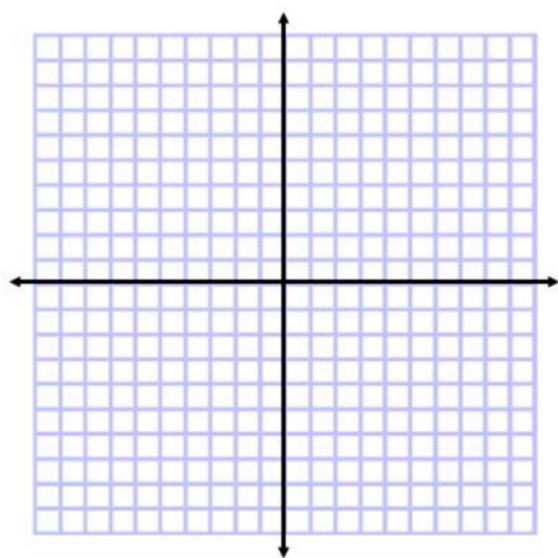
$$y = \frac{x-2}{-2}$$
$$y = -\frac{1}{2}x + 1$$

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

Graph each function and its inverse.

7. $f(x) = (x - 2)^2$

8. $f(x) = -\frac{x}{2}$

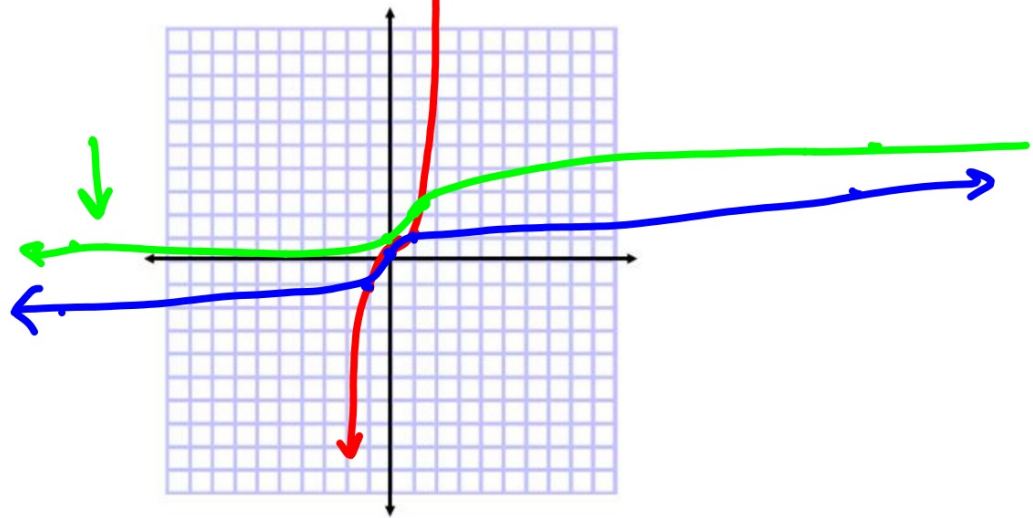


$y = \sqrt[5]{x-1} + 2$

$y = x^5$
 $y = \sqrt[5]{x}$

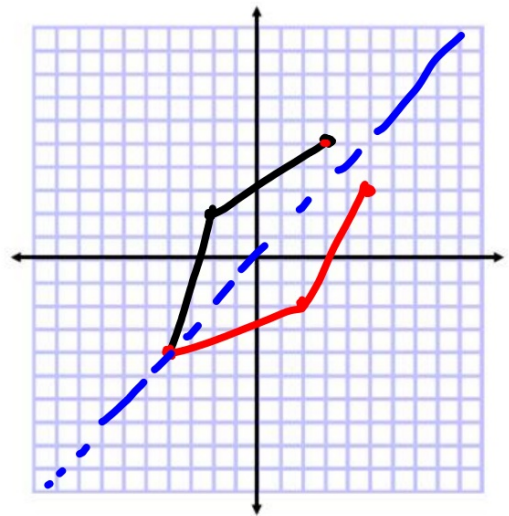
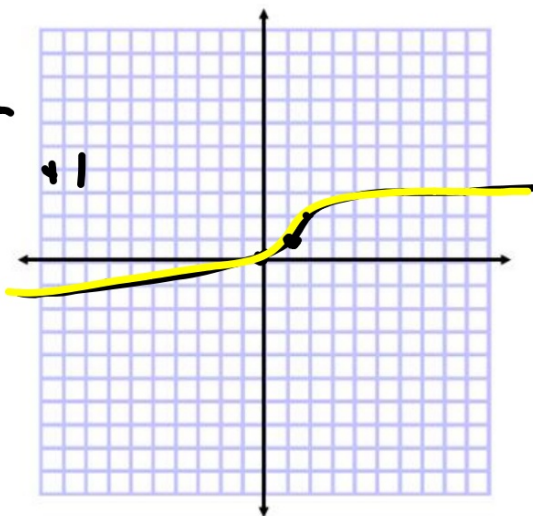
2⁵

(2, 2)



What if I give you a graph and ask for an equation?

$$y = x^3$$
$$y = \sqrt[3]{x-1} + 1$$



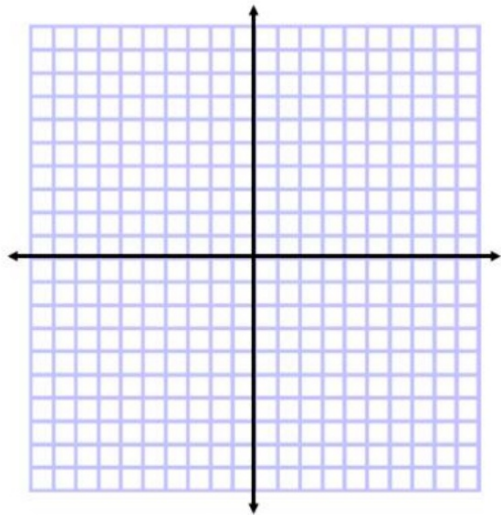
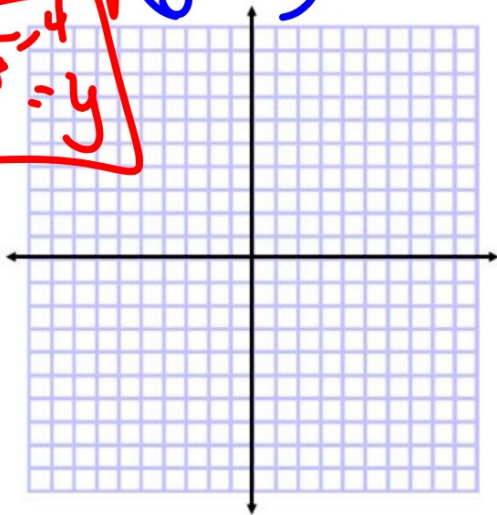
10. $f(x) = x^2 + 8x - 2$

11. $f(x) = x^3 + 4$

$$2 + x = y^2 + 8y + 16$$

$$\sqrt{x+18} = (y+4)^2$$

$$\pm \sqrt{x+18} - 4 = y$$



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

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

$f^{-1}(x)$ no fn.

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

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

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

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

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

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

$$-\sqrt{\frac{4}{x} + 3} \quad \sqrt{\frac{4}{x} + 3}$$

$$\frac{20 \text{ a}}{47 \text{ min}} = \frac{x}{32 \text{ min}}$$

$$47x = 640$$

$$x = 13.617$$

8 s

Answered wrong question. Correction posted to rooms.

WB 3.4

⑧

$$h = \frac{1}{2} g t^2$$

↑ ↑ ↑
height 32 time

$$h = \left(\frac{1}{2} \cdot 32\right) t^2$$

$$h = 16 t^2$$

$$\frac{t}{16} = \frac{16 h^2}{16}$$

$$\sqrt{\frac{t}{16}} = \sqrt{h^2}$$
$$\frac{\sqrt{t}}{4} = h$$
$$\frac{\sqrt{t}}{4} = 1024$$