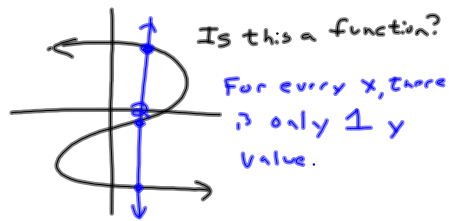


10-24-13  
3<sup>rd</sup> Trig



Is this a function  
{(2,3)(4,7)(2,10)}

when  $x=2$  it has 2  $y$  values  
Not a function

{(2,7)(3,7)(4,7)}



$$\text{Let } f(x) = 3x^2 \quad g(x) = x - 1$$

$$f(-2) = 3(-2)^2 = 12$$

$$g(-5) = -5 - 1 = -6$$

$$\begin{aligned} f(g(x)) &= f(x-1) \\ &= 3(x-1)^2 \\ &= 3(x-1)(x-1) \\ &= 3[x^2 - 2x + 1] \\ &= 3x^2 - 6x + 3 \end{aligned}$$

$$d(x) = 5x - 2 \quad h(x) = 2x + 1$$

$$\begin{aligned} d(d(x)) &= d(5x-2) \\ &= 5(5x-2) - 2 \\ &= 25x - 10 - 2 \\ &= 25x - 12 \end{aligned}$$

$$\begin{aligned} h(d(x)) &= h(5x-2) \\ &= 2(5x-2) + 1 \\ &= 10x - 4 + 1 \\ &= 10x - 3 \end{aligned}$$

Give inverse of  $f$

$$f(x) = 8x - 1$$

$$\textcircled{1} \quad y = 8x - 1$$

$$\textcircled{2} \quad \frac{x = 8y - 1}{\substack{+1 \quad +1}}$$

$$\frac{x+1}{8} = \frac{8y}{8}$$

$$f^{-1}(x) = \frac{x+1}{8}$$

Domain:  $x$ 's that have values

$$\textcircled{1} \quad \text{---} \rightarrow \text{bottom} \neq 0$$

$$\textcircled{2} \quad \sqrt{\text{---}} \rightarrow \text{in } \sqrt{\text{---}} \geq 0$$

$$\frac{8x^{100} - 9x^{10}}{x-7}$$

$$x-7 \neq 0 \\ x \neq 7$$

Domain:  $\mathbb{R}$  except  $x \neq 7$   
 $\mathbb{R}: x \neq 7$



$$\sqrt{3x-12}$$

$$3x-12 \geq 0$$

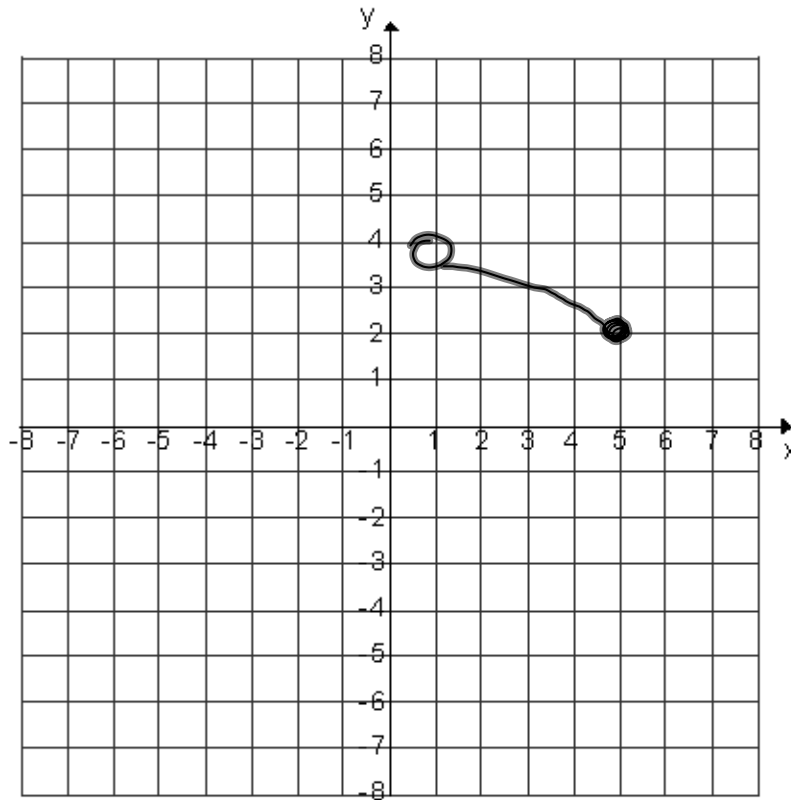
$$\frac{\substack{+12 \quad -12}}{3x \geq 12}$$

Domain  $\mathbb{R}: x \geq 4$



$$x^2 - 9$$

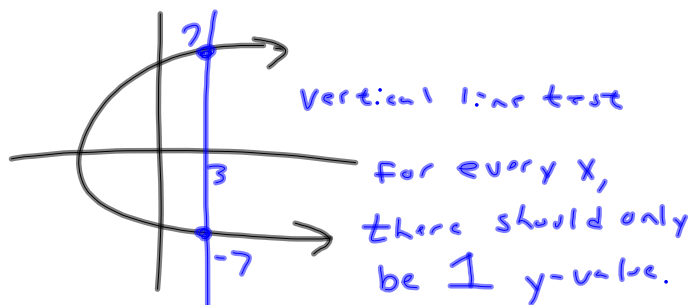
Domain:  $\mathbb{R}$



Domain:  $1 < x \leq 5$   $(1, 5]$   
Range:  $2 \leq y < 4$   $[2, 4)$

10-24-13

4<sup>th</sup> Trig



$$\{(2,4)(3,7)(2,1)\}$$

Not a function since  
when  $x=2$ ,  $y=4$  and  $1$ .

$$f(x) = 3x^2 \quad g(x) = x+5$$

$$f(-2) = 3(-2)^2$$

12

$$g(-5) = -5 + 5$$

0

$$f(g(x)) = f(x+5)$$
$$3(x+5)^2$$

↓ PEMDAS

$$3(x+5)(x+5)$$
$$3(x^2 + 10x + 25)$$
$$3x^2 + 30x + 75$$

$$h(x) = 5x + 2$$

$$h(h(x)) = h(5x+2)$$
$$5(5x+2) + 2$$
$$25x + 10 + 2$$
$$25x + 12$$

$$f(x) = \frac{3x^2 - 10}{x - 17} \leftarrow \text{can't get 0 here}$$

Domain:  $\mathbb{R}$  except  $x \neq 17$

$$f(x) = \sqrt{x - 5}$$

$$\begin{array}{r} x - 5 \geq 0 \\ +5 \quad +5 \\ \hline \end{array}$$

Domain  $\mathbb{R}: x \geq 5$

$$f(x) = 2x - 8$$

Domain:  $\mathbb{R}$

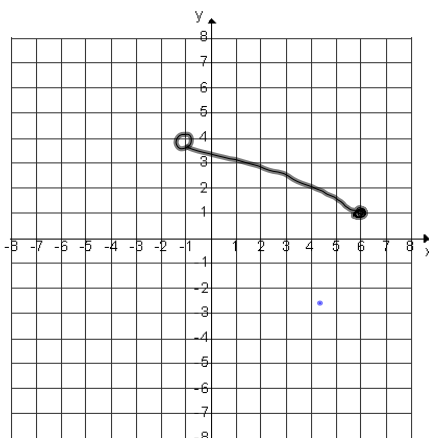
$$f(x) = \frac{x^{2000000} - 5}{x + 4}$$

Domain:  $\mathbb{R}$  except  $x \neq -4$

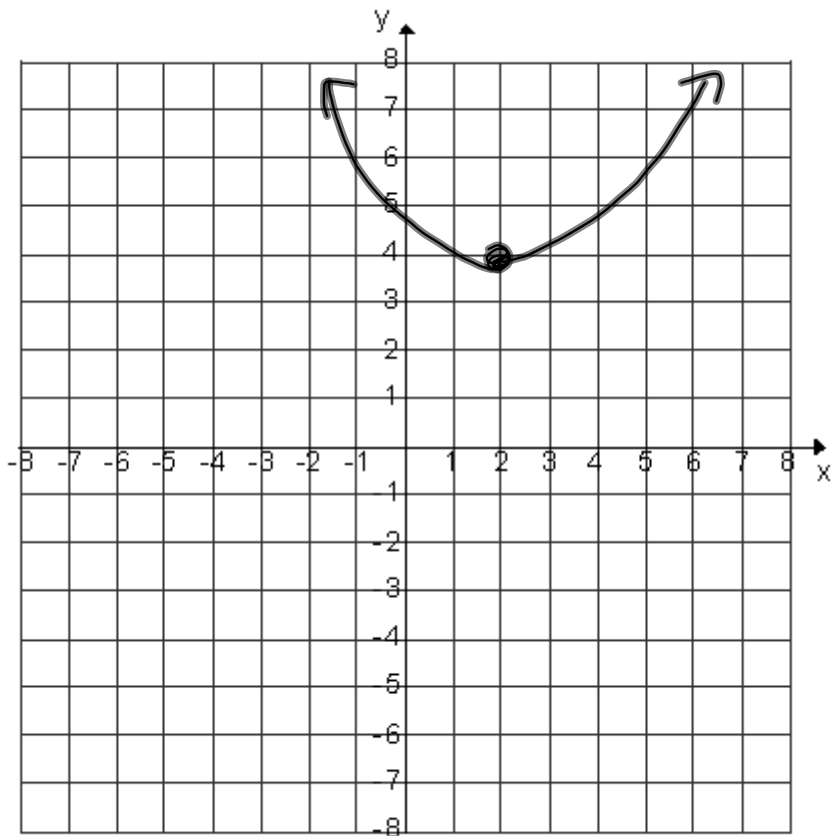
$$f(x) = \sqrt{2x - 1}$$

$$\begin{array}{r} 2x - 1 \geq 0 \\ +1 \quad +1 \\ \hline 2x \geq 1 \end{array}$$

Domain:  $\mathbb{R}: x \geq \frac{1}{2}$



Domain:  $-1 < x \leq 6$   $(-1, 6]$   
 Range:  $1 \leq y < 4$   $[1, 4)$



Domain:  $\mathbb{R}$

Range:  $\mathbb{R}, y \geq 4$