

## Inverse Functions

10.8.15

Warm-up

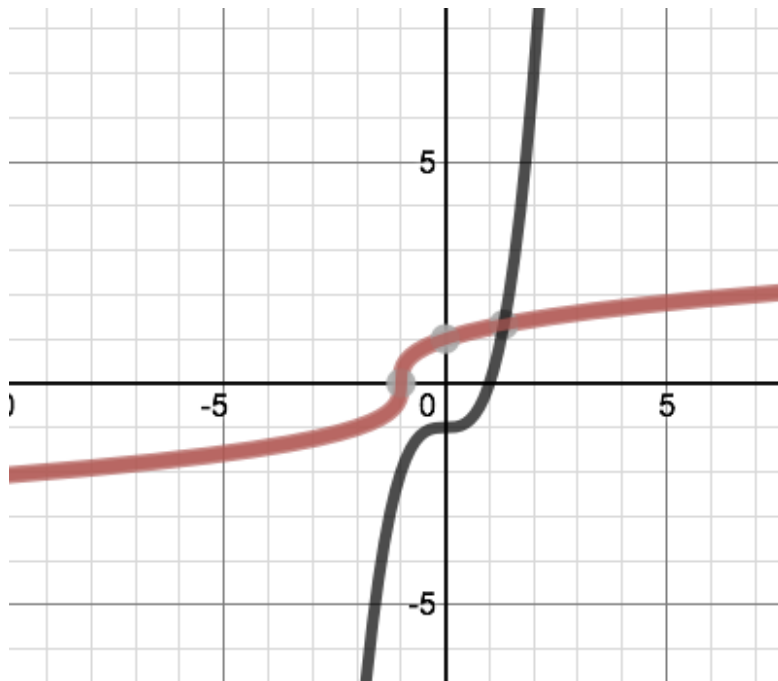
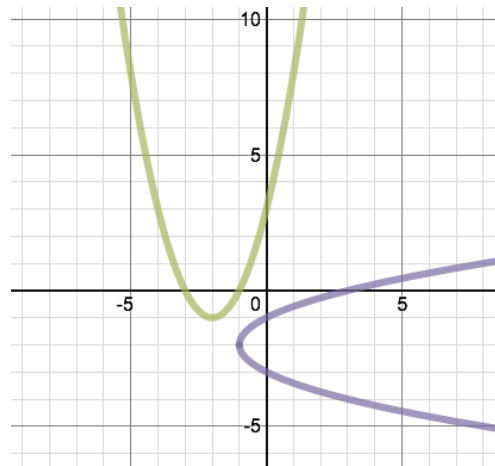
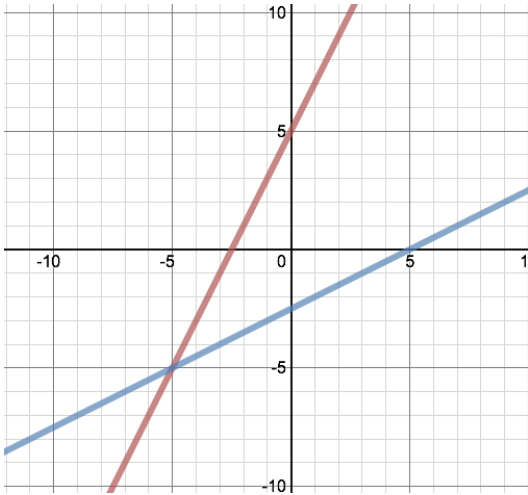
Sketch a graph of

$$1) y = x^3 + 3$$

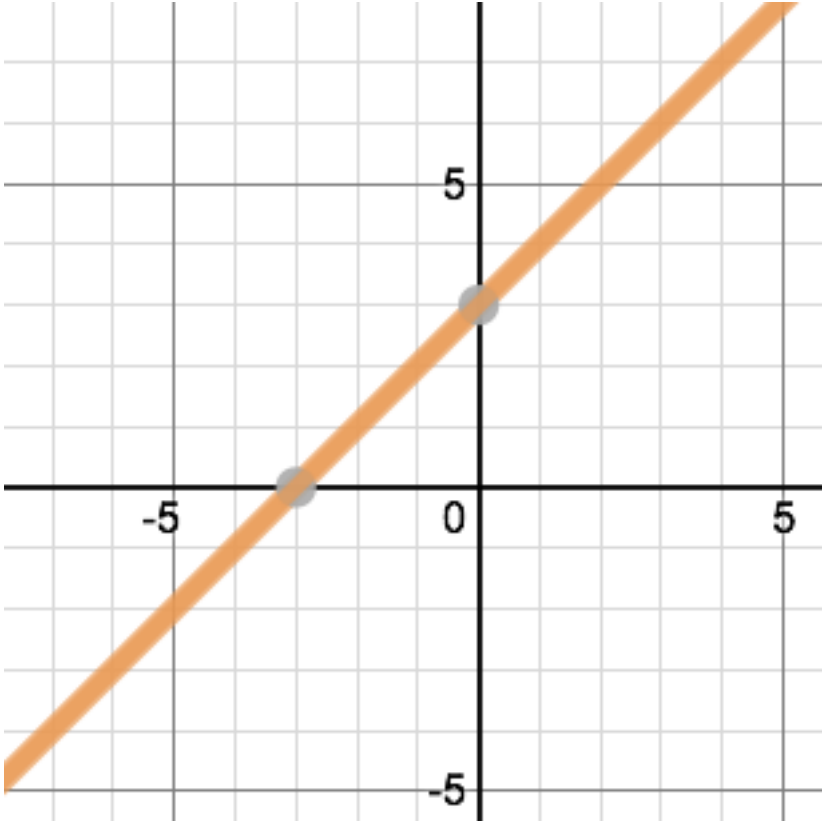
$$2) y = |x + 2| - 3$$

$$3) y = -(x + 1) + 2$$

What is the inverse of a graph?  
What do these graphs have in common?



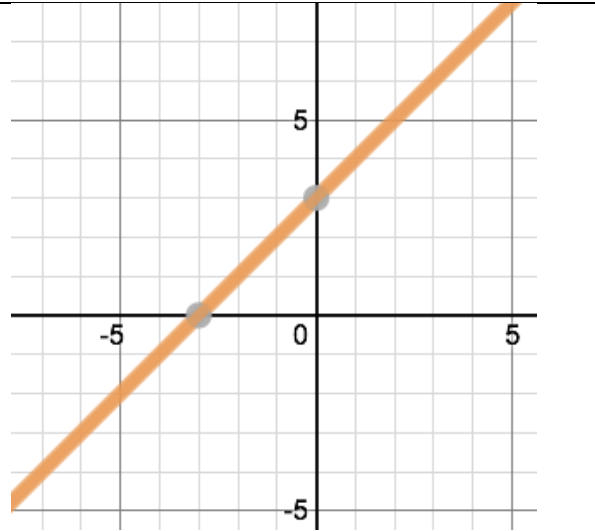
Sketch what you think the inverse of this graph will look like.



I Try:  
Graph the inverse.

Pick a couple points on the graph.

X	Y

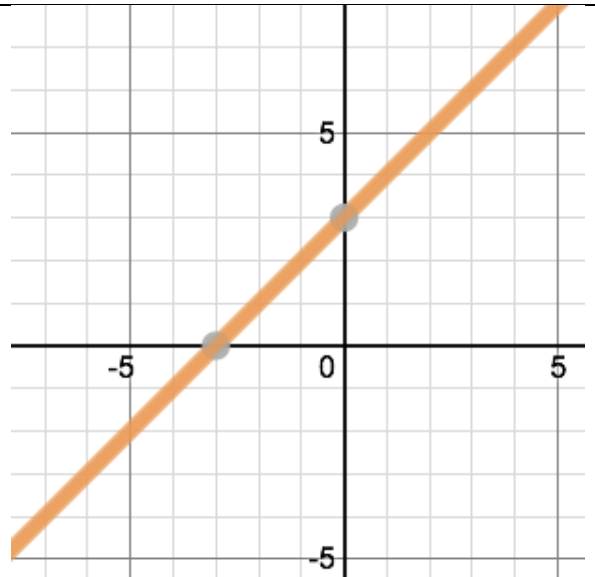


Flip the points

X	Y

X	Y

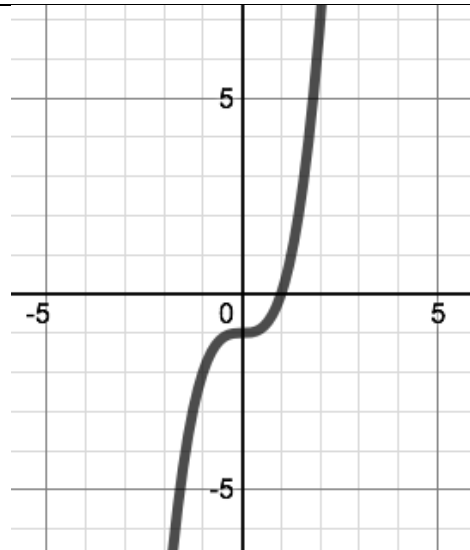
Graph the points



We Try:  
Graph the inverse.

Pick a couple points on the graph.

X	Y

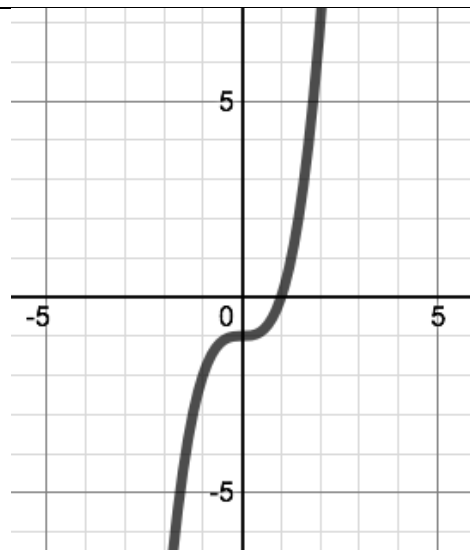


Flip the points

X	Y

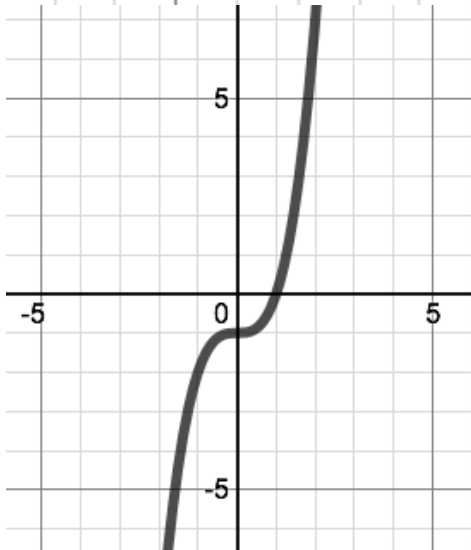
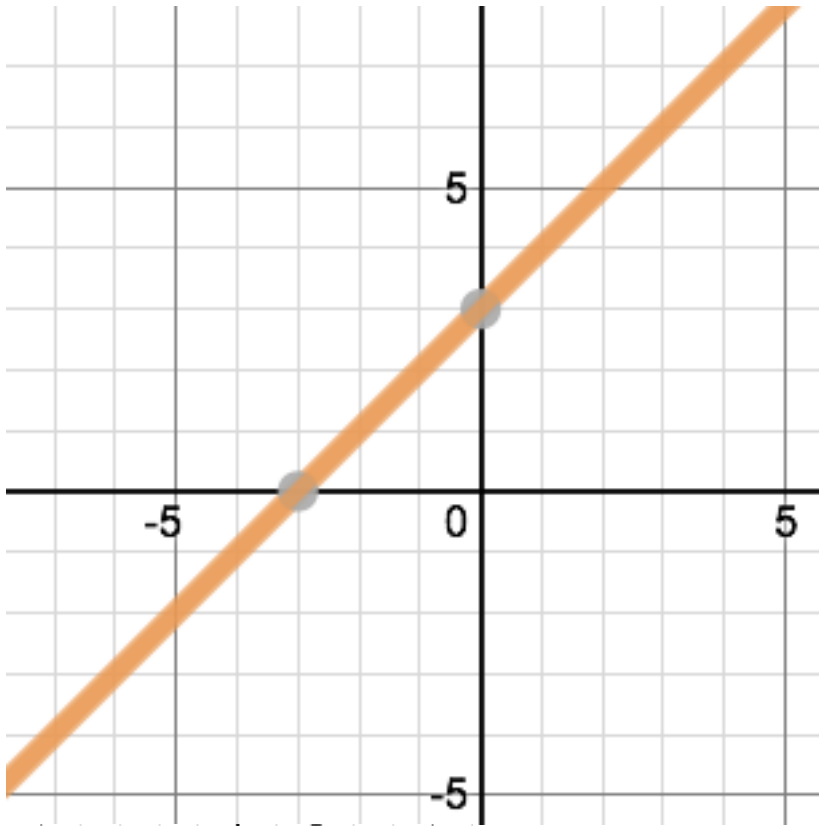
X	Y

Graph the points



How can you tell if a line is a function?

The original function passes the horizontal line test, the inverse will be a function.



Keep Warm

Work on these problems.

Solve for  $y$ .

$$\text{IE: } y + 2 = x$$

$$y = x - 2$$

$$1) x = \frac{1}{y}$$

$$2) x = \frac{1}{(y + 2)^2}$$

$$3) x = (y + 1)^2 + 2$$

What are the factors of

$$4) x^2 + 4x + 4$$

$$5) x^2 - 6x + 9$$

$$6) x^2 + 10x + 25$$

To find the inverse function, swap the x and y and solve for y.

I do:

Find the inverse function of

$$y = 2x + 3$$

Original Function	$y = 2x + 3$
Swap "x" and "y"	
Solve for y	



I Do:

Find the inverse function of

$$y = \frac{1}{(x + 2)^2} - 10$$

Original Function	$y = \frac{1}{(x + 2)^2} - 10$
Swap "x" and "y"	
Solve for y	

We Do:

Find the inverse function of

$$y = (x + 2)^2 - 10$$

Original Function	$y = (x + 2)^2 - 10$
Swap "x" and "y"	
Solve for y	

\*HINT\* If there is a quadratic, you might want to complete the square.

I Do:

Find the inverse function of

$$y = x^2 - 6x + 5$$

Original Function	$y = x^2 - 6x + 5$
Swap "x" and "y"	
Complete the square.	
Solve for y	

We Do:

Find the inverse function of

$$y = x^2 - 4x + 2$$

Original Function	$y = x^2 - 4x + 2$
Swap "x" and "y"	
Complete the square.	
Solve for y	

You do with your partner in your notebook:

Find the inverse function of

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

Original Function	
Swap "x" and "y"	
Solve for y	

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You do with your partner in your notebook.

Find the inverse.

$$y = x^2 - 12x + 5$$

Closure:

Exit Slip

On a half piece of paper!

Find the inverse

1)  $y = x^2 - 4x + 5$

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