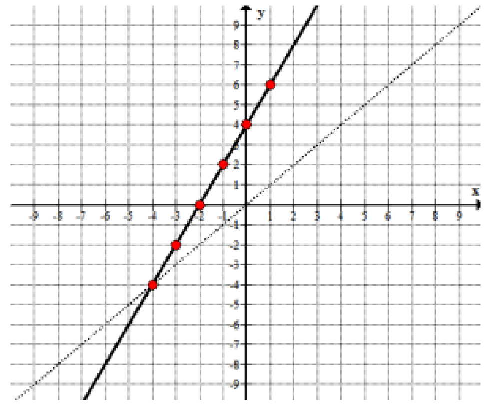
Inverse Functions through Graphs Name______________________

An inverse function, written $f^{-1}(x)$, undoes the function f(x). f(2) = 8 means the point (2,8) will be on the graph, when 2 is input, the output is 8. The inverse function $f^{-1}(x)$ undoes the function f(x). So when you input 8 into the inverse function you get 2 as the output or the point (8,2) will be on the graph or in function notation $f^{-1}(8) = 2$.

1) Fill in the points from the graph for the function f(x) and then fill in the points for the inverse function $f^{-1}(x)$. Then graph the inverse.



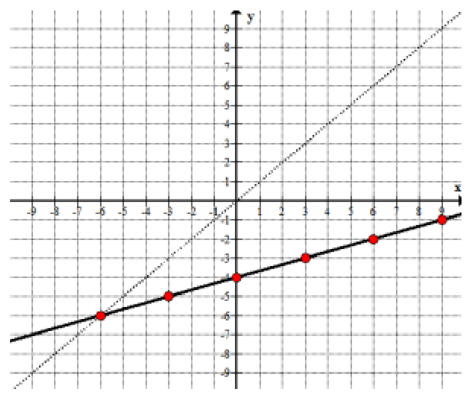
f(x)	
x	y
- 3	- 2

$f^{-1}(x)$	
x	y
-2	-3

Write linear functions for both the function and the inverse function:

f(x) = ____________________ $f^{-1}(x)$ = ____________________

2) Fill in the points from the graph for the function f(x) and then fill in the points for the inverse function $f^{-1}(x)$. Then graph the inverse.



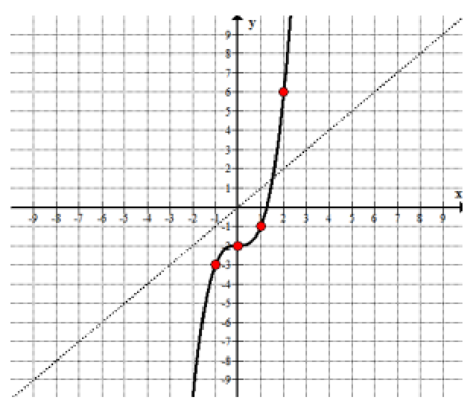
f(x)	
x	y

$f^{-1}(x)$	
x	y

Write linear functions for both the function and the inverse function:

f(x) = ____________________ $f^{-1}(x)$ = ____________________

3) Fill in the points from the graph for the function f(x) and then fill in the points for the inverse function $f^{-1}(x)$. Then graph the inverse function.



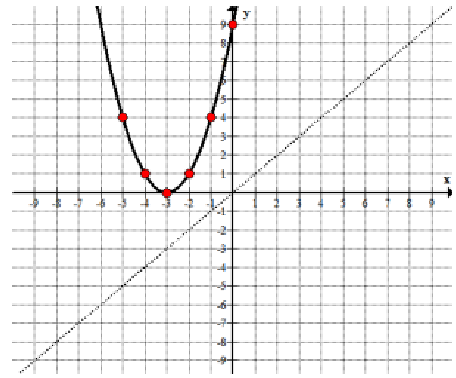
f(x)	
x	y

$f^{-1}(x)$	
x	y

Use your knowledge of parent functions and transformations to write functions for both the function and the inverse function.

f(x) = ____________________ $f^{-1}(x)$ = ____________________

4) Fill in the points from the graph for the function f(x) and then fill in the points for the inverse function $f^{-1}(x)$. Then graph the inverse.



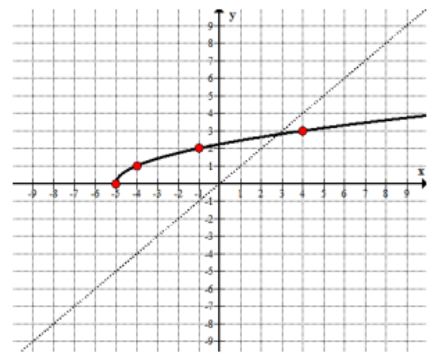
f(x)	
x	y

$f^{-1}(x)$	
x	y

Is the inverse that you plotted a function?

In order for a function to have an inverse it must be one-to-one. The test to see if a function is one-to-one is called the horizontal line test and it works like the vertical line test. If you can draw a horizontal line that hits the graph twice then the function is NOT one-to-one. In order to be able to find an inverse for this function, the domain of the original function will need to be restricted. If the original function had been restricted for values of $x \geq -3$, then the function would have an inverse.

5) Fill in the points from the graph for the function f(x) and then fill in the points for the inverse function $f^{-1}(x)$. Is the function one-to-one?
If yes, then graph the inverse function.



f(x)	
x	y

$f^{-1}(x)$	
x	y

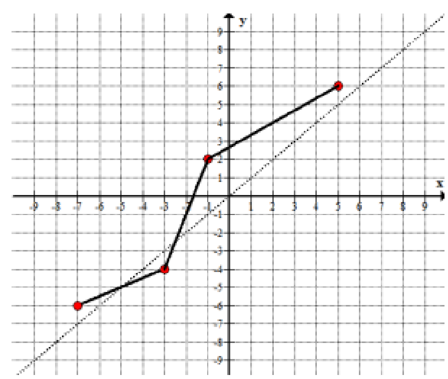
Use your knowledge of parent graphs and transformations to write the original function. Then list the domain and range for the original function. Swap the domain and range for the original function to get the domain and range of the inverse function. The inverse function is a portion of a parabola.

f(x) = ____________________ $f^{-1}(x)$ = ____________________

D:______________________ D:______________________

R:______________________ R:______________________

6) Fill in the points from the graph for the function f(x) and then fill in the points for the inverse function $f^{-1}(x)$. Is the function one-to-one?
If yes, graph the inverse function.



f(x)	
x	y

$f^{-1}(x)$	
x	y

Look back over the graphs of the original functions and their inverses. Notice that the graphs of the inverses are reflections of the original function. Over what line is the inverse a reflection?