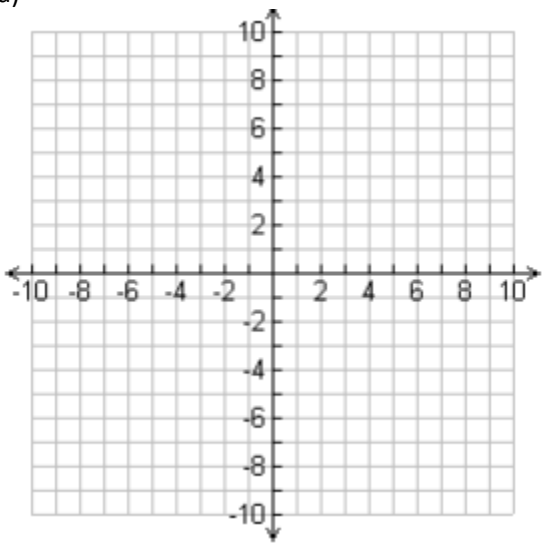
Building Inverse Functions Name: _____A#____

This lesson is about the inverse of a function – where the independent variable is exchanged with the dependent variable. In this investigation, you will find some equations for some inverses, and then discover how they relate to the original function.

Step One: Graph each function on a separate coordinate system. Use your calculator table to help find specific points. Fill in the table with at least 4 points from the function.

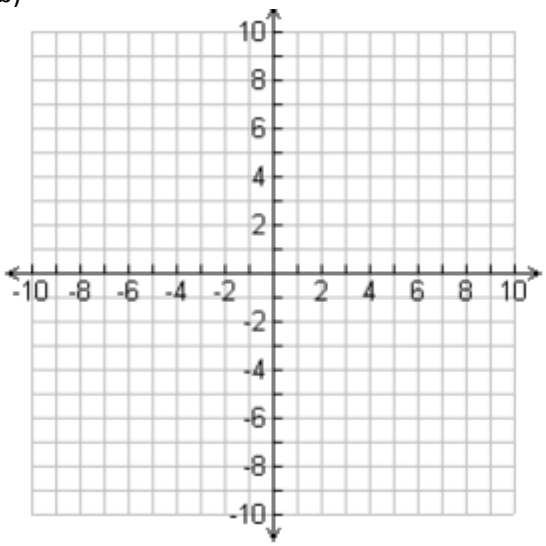
a) $f(x) = 6 + 3x$	b) $g(x) = (x-2)^2 - 5$	c) $p(x) = \sqrt{x+4} - 3$	d) $q(x) = \frac{1}{2}x^3$

a)



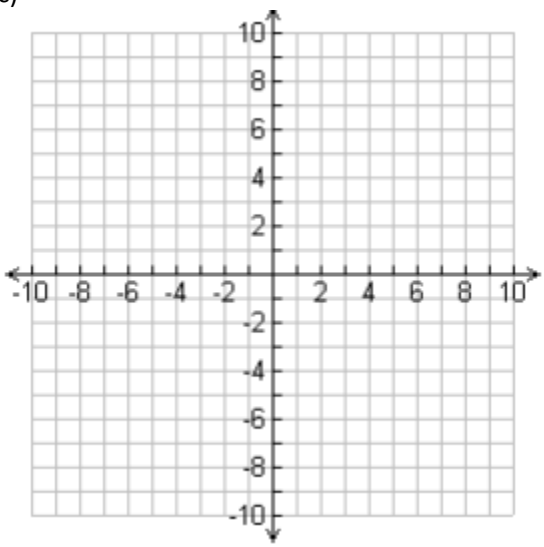
x	y

b)



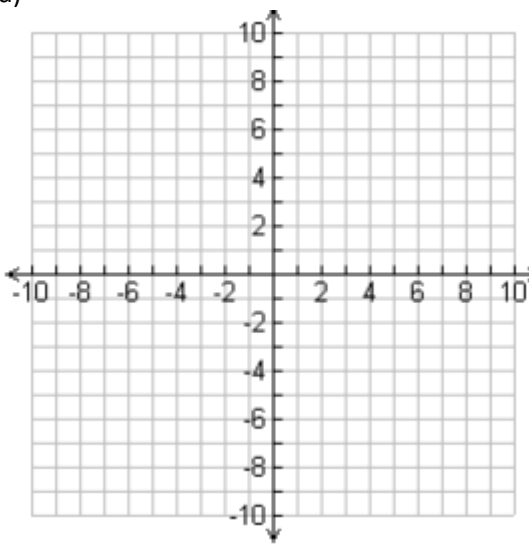
x	y

c)



x	y

d)



x	y

Step Two: Reverse the coordinates of your points. That is change each (x,y) into (y,x). Fill the tables below with the new coordinates. Using a different color add these new points to your coordinate planes above to form the graph of the inverse of the original function.

a)

x	y

b)

x	y

c)

x	y

d)

x	y

Step Three: For each function and its inverse identify the domain and range and end behavior.

a) Identify the following for the functions $f(x)$	b) Identify the following for the functions $g(x)$	c) Identify the following for the functions $p(x)$	d) Identify the following for the functions $q(x)$
Domain:	Domain:	Domain:	Domain:
Range:	Range:	Range:	Range:
End Behavior:	End Behavior:	End Behavior:	End Behavior:
Identify the following for the inverse of $f(x)$. $(f^{-1}(x))$	Identify the following for the inverse of $g(x)$. $(g^{-1}(x))$	Identify the following for the inverse of $p(x)$. $(p^{-1}(x))$	Identify the following for the inverse of $q(x)$. $(q^{-1}(x))$
Domain:	Domain:	Domain:	Domain:
Range:	Range:	Range:	Range:
End Behavior:	Why is the end behavior hard to describe for this problem?	End Behavior:	End Behavior:

What do you notice about the domain and range of a function and its inverse?

Step Four: Draw in the line y=x for each graph. What observations can you make about the graph of a function and its inverse?

Step Five: Think about what you saw with each graph of the inverse functions. How do you think you could find the equation of an inverse function?