

Inverse Functions

Properties of Inverse Relations

Given a function f :

- f^{-1} is the name for the inverse relation
- if $(a,b) \in f$, then $(b,a) \in f^{-1}$ (Read: if the point (a, b) is a solution of the function f , then the point (b, a) is a solution of the inverse relation f^{-1})
- The domain of f is the range of f^{-1} , and the range of f is the domain of f^{-1}
- The graph of $y = f^{-1}(x)$ is a reflection of $y = f(x)$ about the line $y = x$
- To determine the equation of the inverse, interchange x and y , then solve for y .

#1

a) Given $f(x) = 3x - 6$

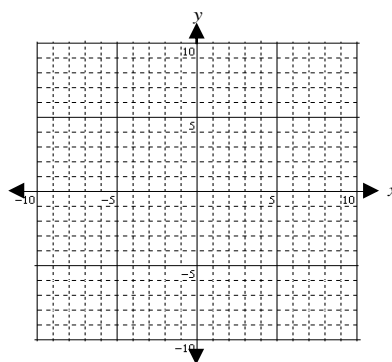
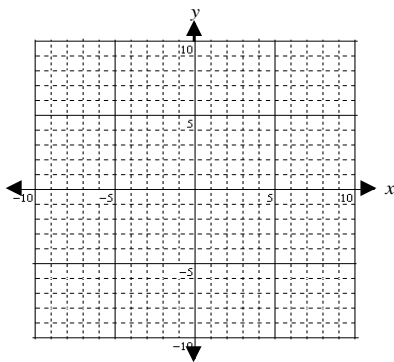
create a Table of Values, and graph.

x	$y=3x-6$
-1	
0	
1	
2	
3	

b) Create a table of values for the *inverse* and graph the inverse relation.

x	y

c) Determine the equation of the inverse.



a) Evaluate the following using the Table of Values

- i) $f(-1)$ ii) $f^{-1}(-9)$ iii) $f(2)$ iv) $f^{-1}(0)$

b) Evaluate the following using Algebra

- v) $f^{-1}(a-4)$

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#2

Determine the inverse of each function algebraically.

a) $f(x) = -2 - 3x$ b) $f(x) = -\frac{1}{4}x - 2$

#3

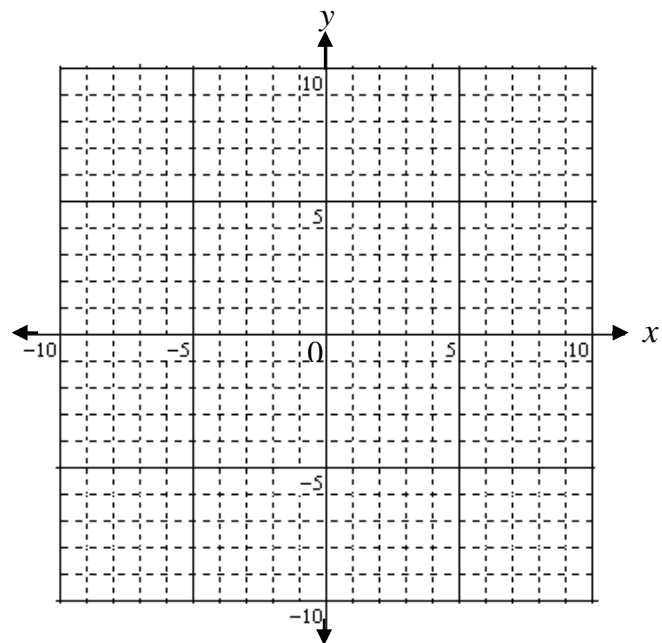
1) Graph $f(x) = (x-2)^2 + 6$

Graph the Parent Function and transformations

2) Identify five points

3) Graph the Inverse by swapping x and y.

4) Determine the equation of the inverse from the graph, using your knowledge of the Square Root function and transformations (*hint - there will be two equations*)



5) Now determine the Inverse Relation using only algebra.

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#4

1) Graph $f(x) = -2(x+5)^2 + 2$

Graph the Parent Function and transformations

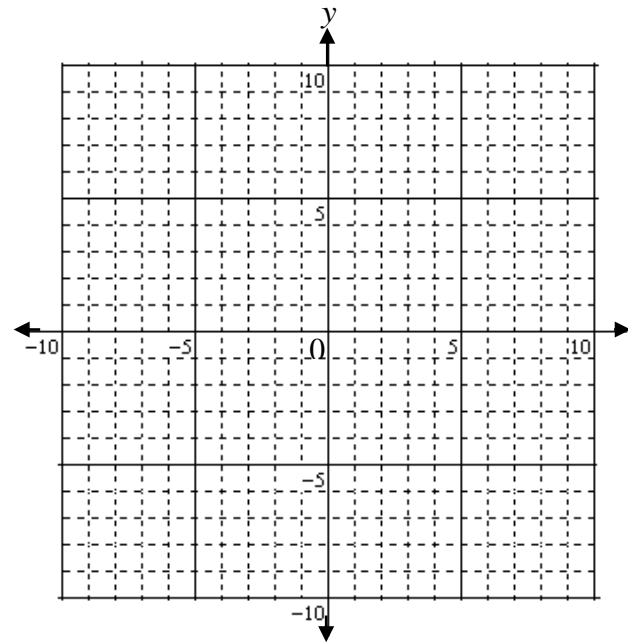
2) Identify five points

3) Graph the Inverse by swapping x and y.

4) Determine the equation of the inverse from the graph, using your knowledge of the Square Root function and Transformations.

(hint - there will be two equations)

5) Now determine the Inverse Relation using only algebra.



#5

1) Given $f(x) = -(x + 5)^2 - 7$, determine the Inverse algebraically.

2) Graph the original function and the inverse using graphing technology

3) 'Sketch' the graphs of the original function and the inverse