Section 6-2 Inverse Functions and Relations

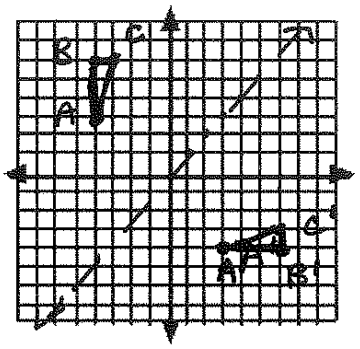
Inverse Relation: is a set of ordered pairs obtained by exchanging the coordinates of each ordered pair.

1. The ordered pairs of the relation $\{(-4,+3), (-4,+6), (-3,+6)\}$ are the coordinates of the vertices of a right triangle. Find the inverse of this relation. Describe the graph of the inverse.

$A(-4,3) \rightarrow A'(3,-4)$

$B(-4,6) \rightarrow B'(6,-4)$

$C(-3,6) \rightarrow C(6,-3)$



Note: the reflection over the $x=y$ line.

Inverse Functions: $f(x)$ is a function $f^{-1}(x)$ is the inverse.
① Switch x and $f(x)$ or "y" ② Solve for $f(x)$ or "y"

Find the inverse of each function. Then graph the function and its inverse.

2. $f(x)=\frac{x-3}{5}$ or $y=\frac{x-3}{5}$

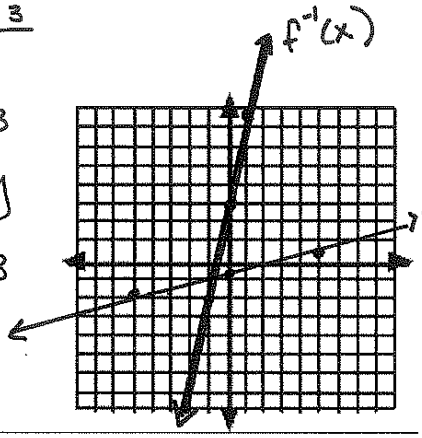
① $x=\frac{y-3}{5}$

② $5x=y-3$

$5x+3=y$

$f^{-1}(x)=5x+3$

note: the reflection over "$y=x$"



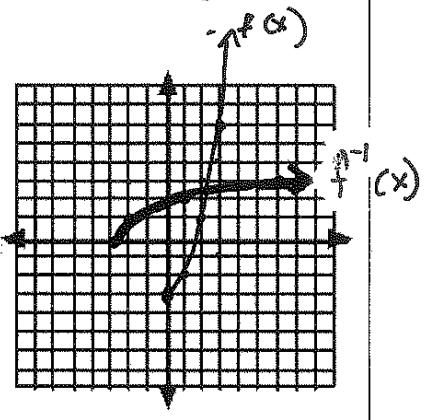
$f(x)$	$f^{-1}(x)$
(0,3)	(-3,0)
(1,-2)	(-2,1)
(2,1)	(1,2)
(3,6)	(6,3)

3. For $x \geq 0$, $f(x)=x^2-3$ or $y=x^2-3$

① $x=y^2-3$

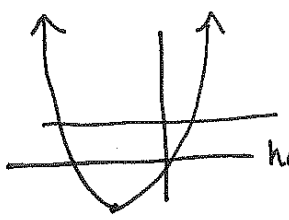
$x+3=y^2$

$\sqrt{x+3}=y$



Use the **horizontal line test** to determine whether the inverse of each function is also a function.

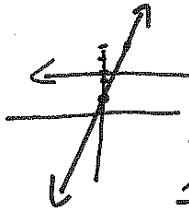
4. $f(x)=x^2+4x-2$



The inverse of $f(x)$ will not be a function

horizontal line

5. $f(x)=4x+1$



horizontal line

The inverse of $f(x)$ will be a function