I can find the INVERSE of a function algebraically.

The first step to finding the inverse of

$h(x)=\sqrt{2x+1}+5$ is to switch the x

and the y to form the equation

$x=\sqrt{2y+1}+5$

Then solve this equation for y by

Reversing Operations.

$$x=\sqrt{2y+1}+5$$
$$-5 \qquad -5$$
$$x-5=\sqrt{2y+1}$$
$$(x-5)^2=2y+1$$
$$\frac{(x-5)^2-1}{2}=y^{-1}=h^{-1}(x)$$

I can find the INVERSE from a given table.

The table representing the inverse $f^{-1}(x)$ can be

created by switching x & y

x	f(x)
-8	-2
-1	-1
0	0
1	1
8	2

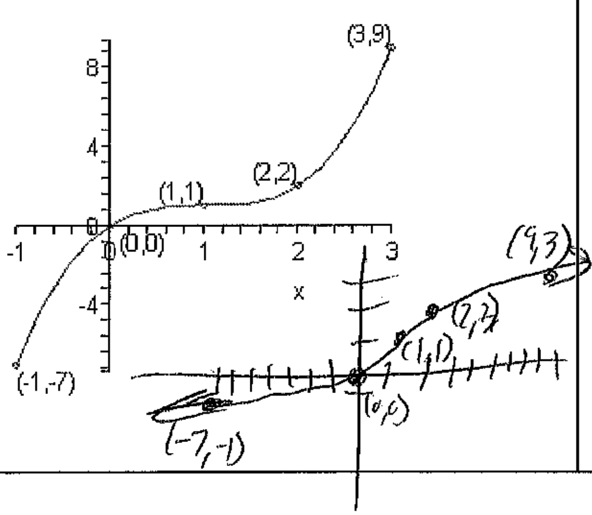
x	$f^{-1}(x)$
-2	-8
-1	-1
0	0
1	1
2	8

I can graph the INVERSE from a given graph.

To draw the INVERSE, I locate points on the

original graph and switch the x and the y and

graph these new points.

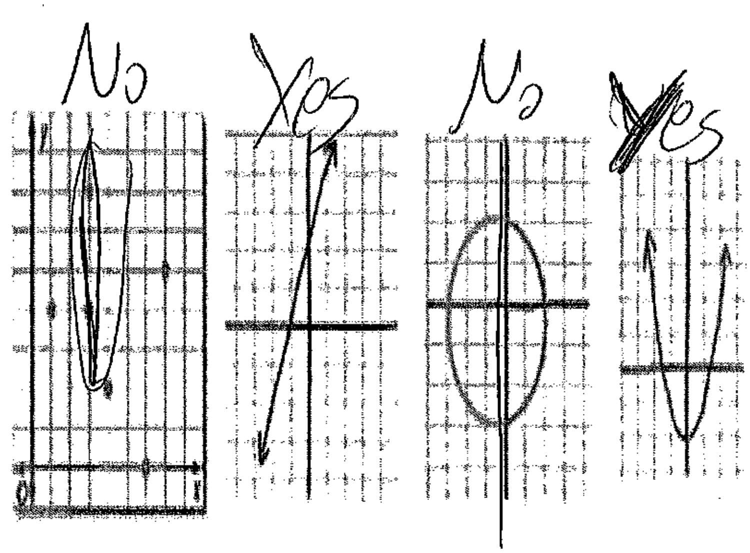


I can use a graph to determine whether or not a RELATION is a FUNCTION.

The Vertical Line Test shows that a

RELATION is a function if any vertical line

hits the graph in AT MOST one point.



I can use a table to determine whether or not a RELATION is a FUNCTION.	I can use COMPOSITE FUNCTIONS to determine whether on not two functions are INVERSES.
If a table has repeated X values that have different y values then the table is not a function If each X value in a table has only one y value then the table is a function	$f(x) = 2\sqrt{x-1} + 2$ and $g(x) = (\frac{x-2}{2})^2 + 1$ The COMPOSITE FUNCTION $f(g(x))$ means you replace the x in f(x) with g(x) $2\sqrt{(\frac{x-2}{2})^2+1-1}+2$ $2\sqrt{(\frac{x-2}{2})^2}+2$ $2(\frac{x-2}{2})+2$ $x-2+2=x$ If two functions are INVERSES then $f(g(x))$ simplifies to x. This makes sense because if two functions are INVERSES, combining the two functions should cancel out

x	y
3	3
4	5
5	7
5	9
6	11

No

x	y
5	31
6	28
7	25
8	22
9	19

Yes

x	y
2	3
3	3
4	3
5	3
6	3

Yes

x	y
7	10
8	20
9	30
9	40
10	50

No

Function Practice: Let $f(x) = (x-3)^3 + 5$ **and** $g(x) = \sqrt[3]{x-5} + 3$

Find the following:

1. $f(3) = (3-3)^3+5$
   $=5$

2. $g(5) = \sqrt[3]{5-5} + 3$
   $= \sqrt[3]{0} + 3$
   $= 3$

3. $g(f(0)) = g((0-3)^3+5)$
   $= g(-27+5)$
   $= g(-22)$
   $= \sqrt[3]{-22-5} + 3$
   $= 0$

4. $f(g(4)) = 4$

Solve the following:

5. $f(x) = 5$
   $(x-3)^3+5=5$
   $(x-3)^3=0$
   $x=3$

6. $g(x) = 3$
   $\sqrt[3]{x-5}+3=3$
   $\sqrt[3]{x-5}=0$
   $x=5$

7. $f(x) = 4$
   $(x-3)^3+5=4$
   $(x-3)^3=-1$
   $x=2$

8. $g(x) = 0$
   $\sqrt[3]{x-5}+3=0$
   $\sqrt[3]{x-5}=-3$
   $x-5=-27$
   $x=-22$

Simplify the following:

9. $f(g(x))$
   $(\sqrt[3]{x-5}+\cancel{3}-\cancel{3})^3+5$
   $(\sqrt[3]{x-5})^3+5$
   $x-5+5=x$

10. $g(f(x))$
   $\sqrt[3]{(x-3)^3+\cancel{5}-\cancel{5}} + 3$
   $\sqrt[3]{(x-3)^3}+3$
   $x-3+3=x$