AGS 2
Module 4.4 & 4.5 Homework

Name key
Period

Find the inverse of each relation shown below. Determine whether the inverse is a function or not. If not, why not? Be specific.

1.

x	-2	-1	0	1	2
f(x) y	-8	-7	-6	-5	-4

x	-8	-7	-6	-5	-4
$f^{-1}(x)$	-2	-1	0	1	2

$f^{-1}(x)$ is a function because each x-value has only one y-value.

2. $M = \{(-2,-5),(-1,-5),(0,-5),(1,-5),(2,-5)\}$

M^{-1} is not a function because when $x=-5$, y is a lot of different values.

Find the inverse of each function shown below.

3. $g(x) = -7x + 3$

$y = -7x + 3$

$x = -7y + 3$
$-3 \qquad -3$

$\frac{x-3}{-7} = \frac{-7y}{-7}$

$y = \frac{-1}{7}x + \frac{3}{7}$

$\boxed{g^{-1}(x) = \frac{-1}{7}x + \frac{3}{7}}$

4. $h(x) = x^3 + 5$

$y = x^3 + 5$

$x = y^3 + 5$
$-5 \qquad -5$

$\sqrt[3]{x-5} = \sqrt[3]{y^3}$

$y = \sqrt[3]{x-5}$

$\boxed{h^{-1}(x) = \sqrt[3]{x-5}}$

7. $y = \frac{3x-2}{5}$

$5 \cdot x = \frac{3y-2}{\cancel{5}} \cancel{5}$

$5x = 3y \cancel{-2}$
$+2 \qquad \cancel{+2}$

$\frac{5x+2}{3} = \frac{3y}{3}$

$\boxed{y^{-1} = \frac{5}{3}x + \frac{2}{3}}$

8. $y = \sqrt{2-x}$

$x^2 = \sqrt{2-y}^{\,2}$

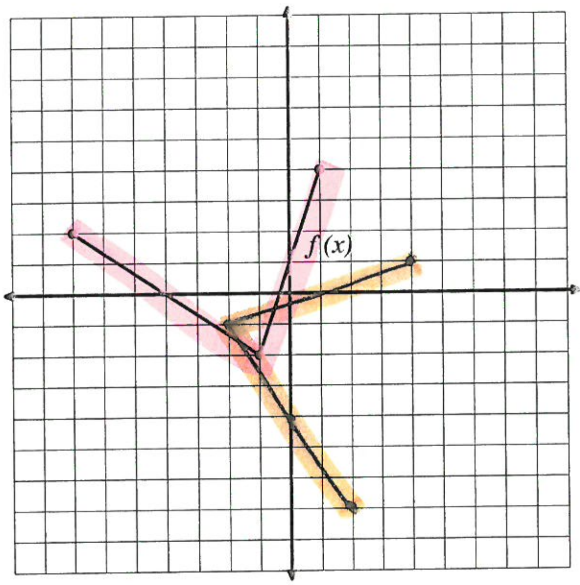
$x^2 = 2 - y$
$-2 \qquad -2$

$\frac{x^2-2}{-1} = \frac{-y}{-1}$

$\boxed{y^{-1} = -x^2 + 2}$

The function f(x) is shown on the graph. Graph $f^{-1}(x)$ on the same set of axes.

9.



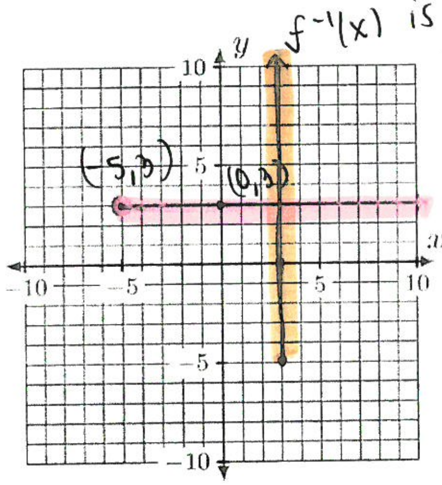
x	f(x)
1	4
-1	-2
-4	0
-7	2

x	$f^{-1}(x)$
4	1
-2	-1
0	-4
2	-7

10. Is the graph of $f^{-1}(x)$ also a function? Justify your answer.

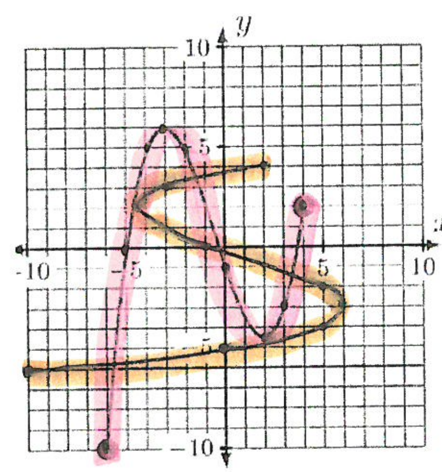
no. It does not pass the vertical line test. One value of x corresponds to multiple values of y.

11.



$f^{-1}(x)$ is <u>not</u> a function. It does not pass the vertical line test.

12.



x	f(x)
-6	-10
-5	0
-4	5
-3	6
-2	5
0	-1
2	-4.5
3	-3
4	2

x	$f^{-1}(x)$
-10	-6
0	-5
5	-4
6	-3
5	-2
-1	0
-4.5	2
-3	3
2	4