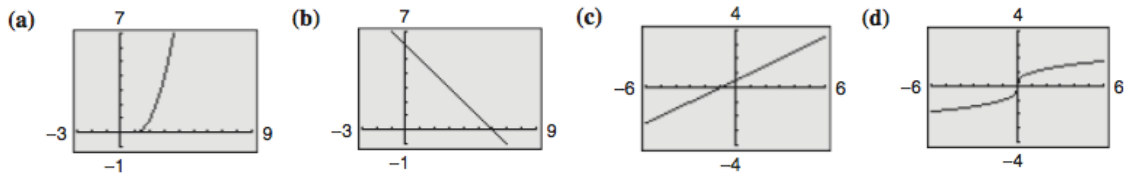


## Alg2: Inverse Functions Homework Worksheet

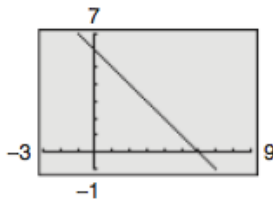
### I.

- How can you show two functions are inverses algebraically?
- How can you show two functions are inverses graphically?
- How can you show two functions are inverses numerically?

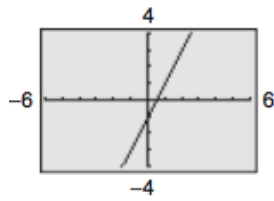
### II. Match the graph of the function with the graph of its inverse function.



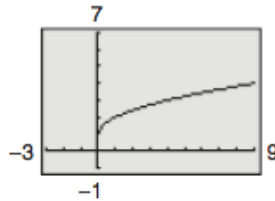
4.



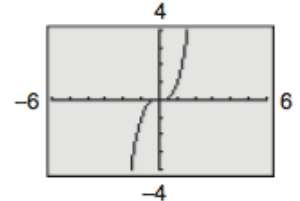
5.



6.

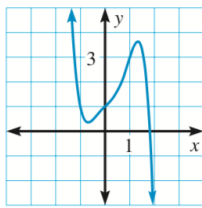


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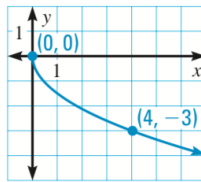


### III. Use the graph to determine whether the inverse is a function. Explain your reasoning.

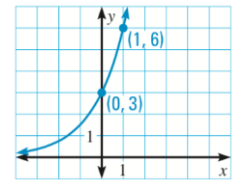
8.



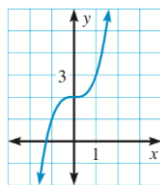
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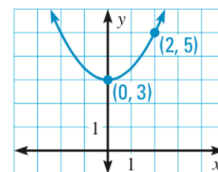
10.



11.



12.



### IV. Are $f$ & $g$ inverse functions? Prove your answer algebraically.

13.  $g(x) = 2x - 4$ ;  $f(x) = \frac{4+x}{2}$

14.  $f(x) = -x^5$ ;  $g(x) = \sqrt[5]{x+2} - 1$

15.  $h(x) = -(x+2)^3$ ;  $f(x) = -\sqrt[3]{x} - 2$

16.  $f(x) = x + 5$ ;  $h(x) = \frac{8+7x}{4}$

### V. Could $f$ & $g$ be inverse functions? Prove your answer numerically. Justify your answer.

17.

$x$	$f(x)$
2	-4
0	5
1	10

$x$	$g(x)$
-4	2
5	0
10	1

VI. Find the inverse function.

18.  $f(x) = 5x + 12$

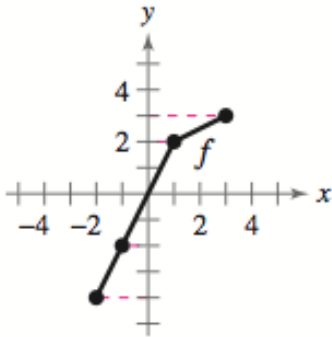
19.  $f(x) = \frac{7x + 18}{2}$

20.  $g(x) = 2(x - 27)^3$

21.  $g(x) = \frac{5}{x} - 3$

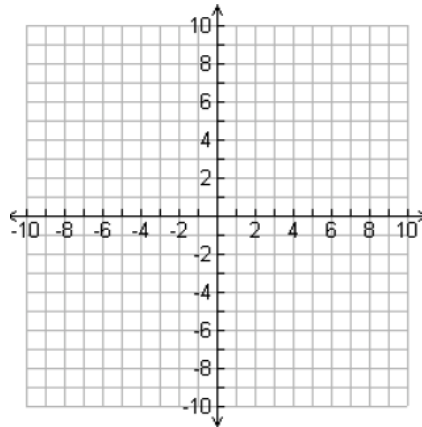
VII.  
22.

- a. Use the graph of the function to complete the table for  $f^{-1}$ .  
 b. Then use the table to sketch  $f^{-1}$ .



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

$x$	$f^{-1}(x)$



## ANSWERS

1. Show  $(f \circ g)(x) = x$  and  $(g \circ f)(x) = x$ .
2. Two functions are inverses if their graphs are reflections about the line  $y=x$ .
3. If  $f(x)$  contains points  $(x, y)$  and  $g(x)$  contains points  $(y, x)$ , then  $f(x)$  and  $g(x)$  are inverses.
4. B
5. C
6. A
7. D
8. No, the inverse is not a function because the graph does not pass the HLT.
9. Yes, the inverse is a function because the graph does pass the HLT.
10. Yes, the inverse is a function because the graph does pass the HLT.
11. Yes, the inverse is a function because the graph does pass the HLT.
12. No, the inverse is not a function because the graph does not pass the HLT.
13. Yes
14. No
15. Yes
16. No
17. Yes,  $f(x)$  contains points  $(x, y)$  and  $g(x)$  contains points  $(y, x)$ .

18.  $f^{-1}(x) = \frac{x-12}{5}$

19.  $f^{-1}(x) = \frac{2x-18}{7}$

20.  $g^{-1}(x) = 2 + \frac{\sqrt[3]{x}}{3}$

21.  $g^{-1}(x) = \frac{5}{x+3}$

22.

a.

$x$	$f^{-1}(x)$
-4	-2
-2	-1
0	0
2	1
3	3

b.

