

33 One-to-one functions. Inverse Functions

Due:

12/15/2015 at 06:00am EST.

Students will be able to:

- Identify one-to-one functions
- Find a formula for inverse function
- Identify the graph of inverse function
- Use the connection between the domain and range of the original and inverse functions
- Use inverse functions

Functions and symbols that WeBWorK understands.

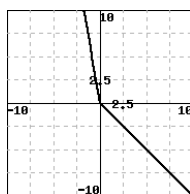
Links to some useful WeBWorK pages for students

1. (1 pt) Let $f(x) = 6x + 9$. Find $f^{-1}(x)$.
 $f^{-1}(x) =$ _____

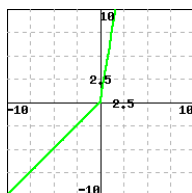
2. (1 pt) Let $f(x) = \frac{4x+3}{9x+9}$. Find $f^{-1}(x)$.
 $f^{-1}(x) =$ _____

3. (1 pt) Let $f(x) = 2x^3 - 10$. Find $f^{-1}(x)$.
 $f^{-1}(x) =$ _____

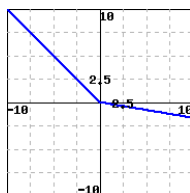
4. (1 pt) Find the graph of the inverse of the function f graphed below.



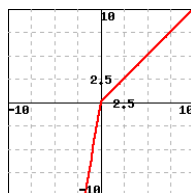
The graph of f



Graph A



Graph B



Graph C

The inverse of the function f is graphed in Graph (A, B or C): _____

5. (1 pt) Find the inverse function to $y = f(x) = \frac{2-7x}{6-2x}$.

$x = g(y) =$ _____

6. (1 pt) Find the inverse function to $y = f(x) = \sqrt[3]{x+1}$.

$x = g(y) =$ _____

7. (1 pt) The function $f(x) = (x+3)^2$ is not one-to-one. Choose a largest possible domain containing the number 100 so that the function restricted to the domain is one-to-one.

The largest possible domain is [_____, _____);
the inverse function is $g(x) =$ _____

Note: If your answer is ∞ , enter *infinity* .

8. (1 pt) Consider the function

$$f(x) = \frac{1}{4x-8}$$

a) Find the inverse of f

$f^{-1}(x) =$ _____,

(b) The domain of f is $x|x \neq$ _____

(c) The domain of f^{-1} is $x|x \neq$ _____

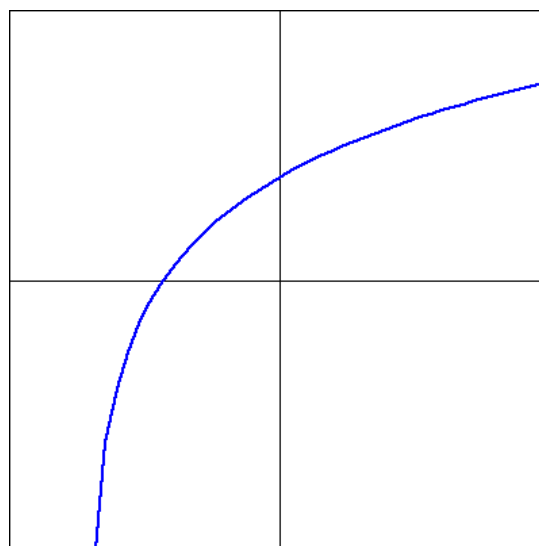
(d) The range of f is $y|y \neq$ _____

(d) The range of f^{-1} is $y|y \neq$ _____

9. (1 pt)

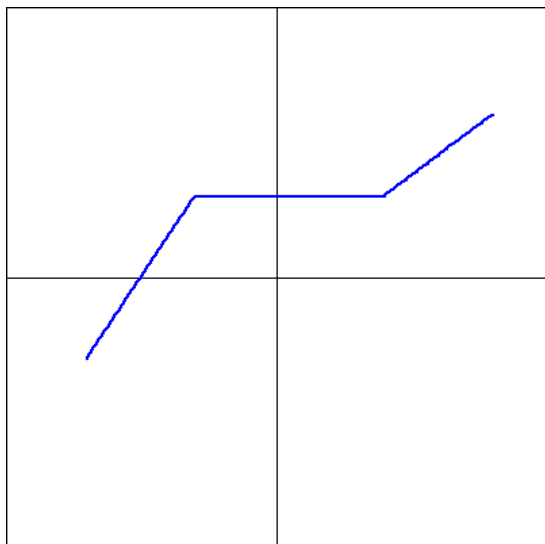
Consider the graphs below.

Determine if the function in the graph is one-to-one.



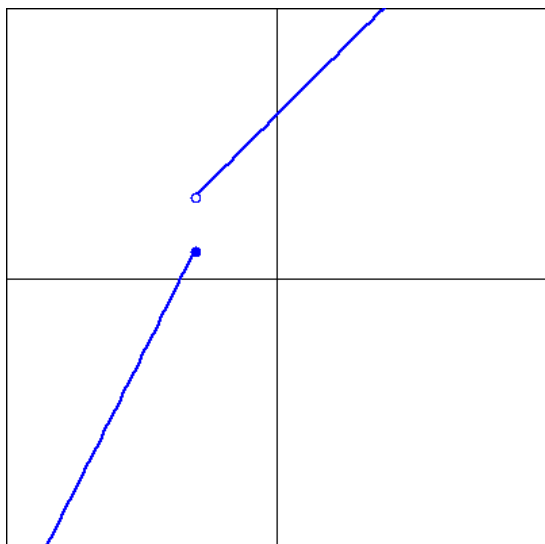
- A. The function **is** one-to-one.
- B. The function **is not** one-to-one.

Determine if the function in the graph is one-to-one.



- A. The function **is** one-to-one.
- B. The function **is not** one-to-one.

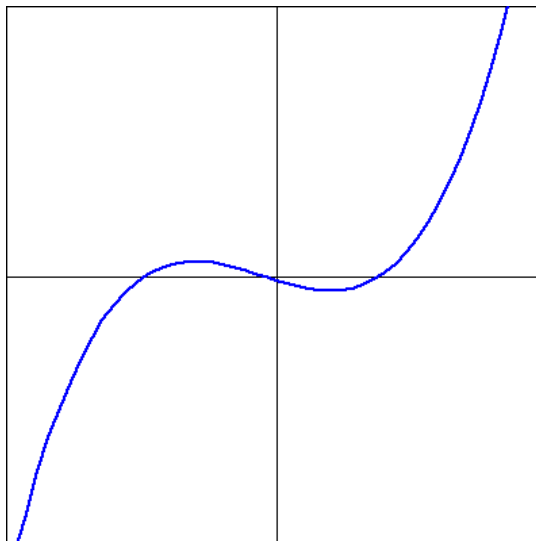
Determine if the function in the graph is one-to-one.



- A. The function **is** one-to-one.

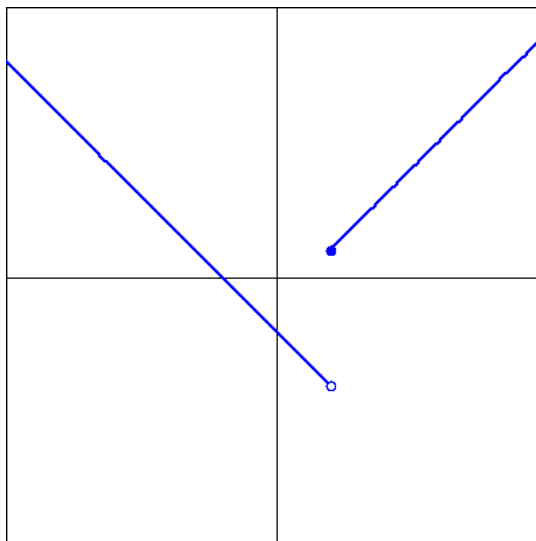
- B. The function **is not** one-to-one.

Determine if the function in the graph is one-to-one.



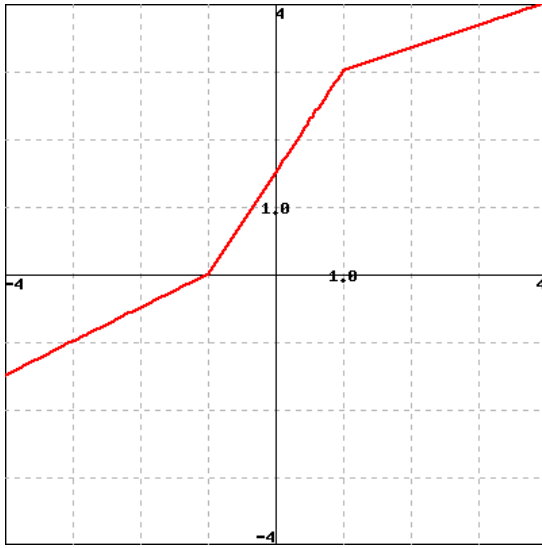
- A. The function **is** one-to-one.
- B. The function **is not** one-to-one.

Determine if the function in the graph is one-to-one.



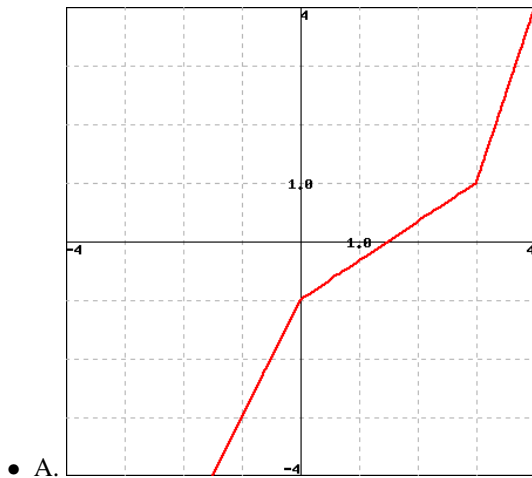
- A. The function **is** one-to-one.
- B. The function **is not** one-to-one.

10. (1 pt) The graph of f is shown below.

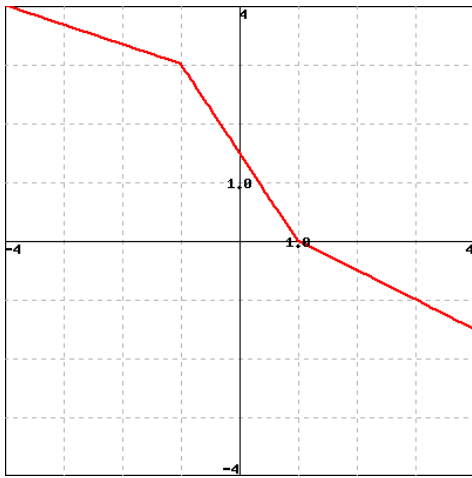


Note: Click on a graph to view a larger graph.

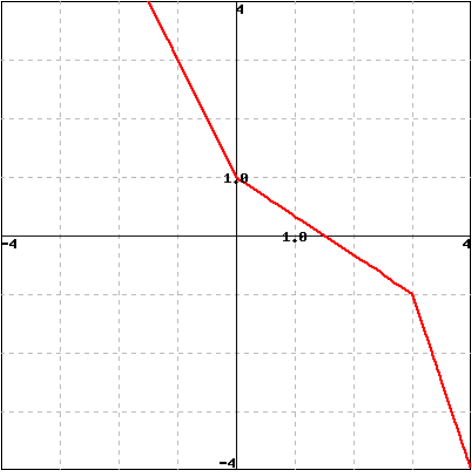
Which of the following is a graph of f^{-1} ?



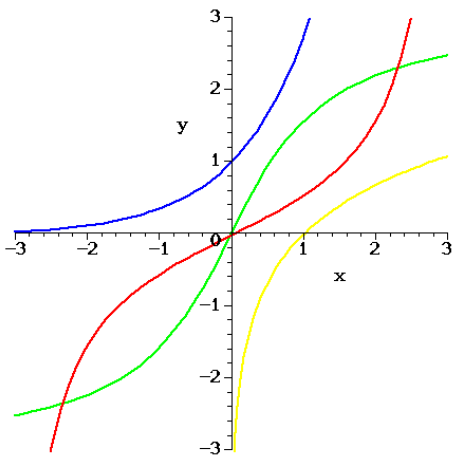
- B.
- C.
- D.



• E.



• F.



11. (1 pt)

This problem illustrates that we can make statements about functions without knowing how they are defined. The Figure shows for functions that form two pairs of functions and their inverses. Enter the letters b for blue, g for green, r for red, and y for yellow below, as appropriate.

The inverse of the blue function is ____.

The inverse of the red function is ____.

The inverse of the green function is ____.

The inverse of the yellow function is ____.

12. (1 pt) Let $f(x) = \lfloor x/2 \rfloor$. We learned that the floor and the ceiling functions are NOT invertible, but we also learned about the set of preimages of any value in the Range, the set of images. Keeping that in mind, give your answer in interval notation if necessary.

(a) Find $f^{-1}(\{2\})$.

Your answer is _____

(b) Find $f^{-1}(\{-3\})$.

Your answer is _____

(c) Find $f^{-1}(\{x \mid 2 \leq x \leq 8\})$.

Your answer is _____

(d) Find $f^{-1}(\{x \mid -8 \leq x \leq -3\})$.

Your answer is _____