WebAssign
1.5 Inversas (Homework)

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Diferencial, section B, Spring 2019
Instructor: Christiaan Ketelaar

Current Score : 15 / 15 **Due :** Sunday, February 10, 2019 11:59 PM CST**Last Saved : n/a Saving... ()**

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

Request Extension

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1. 1/1 points | Previous AnswersSCalc8 6.1.003.

A function is given by a table of values. Determine whether it is one-to-one.

x	1	2	3	4	5	6
$f(x)$	12	12.6	13.7	15.6	13.2	12.6

- Yes, it is one-to-one.
- No, it is not one-to-one. ✓

Solution or Explanation
Click to View Solution

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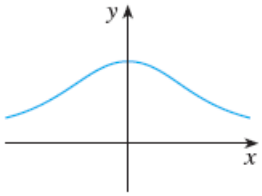
2. 1/1 points | Previous AnswersSCalc8 6.1.005.

A function is given by a graph. Determine whether it is one-to-one.

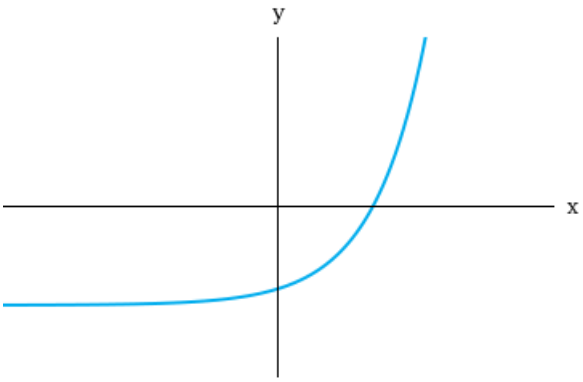


- Yes
- No ✓

Solution or Explanation
We could draw a horizontal line that intersects the graph in more than one point. Thus, by the Horizontal Line Test, the function is not one-to-one.

3. 1/1 points | Previous AnswersSCalc8 6.1.006.

A function is given by a graph. Determine whether it is one-to-one.



- (•) Yes, it is one-to-one.
- ( ) No, it is not one-to-one.

Solution or Explanation

Click to View Solution

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4. 1/1 points | Previous AnswersSCalc8 6.1.010.

A function is given by a formula. Determine whether it is one-to-one.

$f(x) = x^6 - 12$

- ( ) Yes, it is one-to-one.
- (•) No, it is not one-to-one.

Solution or Explanation

The graph of $f(x) = x^6 - 12$ is symmetric with respect to the y-axis. Pick any x-values equidistant from 0 to find two equal function values. For example, $f(-1) = -11$ and $f(1) = -11$, so f is not one-to-one.

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5. 1/1 points | Previous AnswersSCalc8 6.1.016.

A function is given by a verbal description. Determine whether it is one-to-one.

The function $f(t)$ is your height at age t

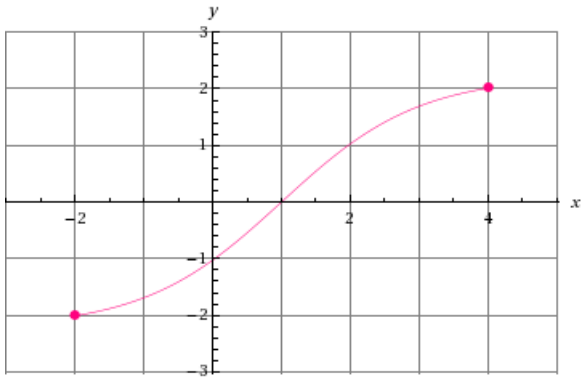
- ( ) Yes, it is one-to-one.
- (•) No, it is not one-to-one.

Solution or Explanation

Click to View Solution

6. 2/2 points | Previous AnswersSCalc8 6.1.020.

The graph of f is given.



(a) Why is f one-to-one?

f is one-to-one because it passes the Horizontal Line Test ✔ Horizontal Line Test .

(b) What are the domain and range of f^{-1}? (Enter your answers in interval notation.)

domain $$[−2,2]

✔ $[-2, 2]$

range $$[−2,4]

✔ $[-2, 4]$

(c) What is the value of $f^{-1}(0)$?

1 ✔ 1

(d) Estimate the value of $f^{-1}(-1)$ to the nearest tenth.

0 ✔ 0

Solution or Explanation

Click to View Solution

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7. 1/1 points | Previous AnswersSCalc8 6.1.024.MI.

Find a formula for the inverse of the function.

$$f(x) = \frac{2x - 1}{2x + 9}$$

$$f^{-1}(x) =$$ $$−1−9x2x−2

✔ $\frac{9x + 1}{2 - 2x}$

Solution or Explanation

Click to View Solution

8. 1/1 points | Previous AnswersSCalc8 6.1.025.

Find a formula for the inverse of the function.

$$f(x) = 2 + \sqrt{3 + 5x}$$

$f^{-1}(x) =$
$$x2−4x+15

$\frac{1}{5}(x-2)^2 - \frac{3}{5}$

Solution or Explanation

$y = f(x) = 2 + \sqrt{3 + 5x}$ $(y \geq 2) \Rightarrow$ $y - 2 = \sqrt{3 + 5x} \Rightarrow$ $(y - 2)^2 = 3 + 5x \Rightarrow$ $(y - 2)^2 - 3 = 5x \Rightarrow$ $x = \frac{1}{5}(y - 2)^2 - \frac{3}{5}$.

Interchange x and y: $y = \frac{1}{5}(x - 2)^2 - \frac{3}{5}$. So $f^{-1}(x) = \frac{1}{5}(x - 2)^2 - \frac{3}{5}$. Note that the domain of f^{-1} is $x \geq 2$.

9. 2/2 points | Previous AnswersSCalc8 6.1.504.XP.

Consider the following function.

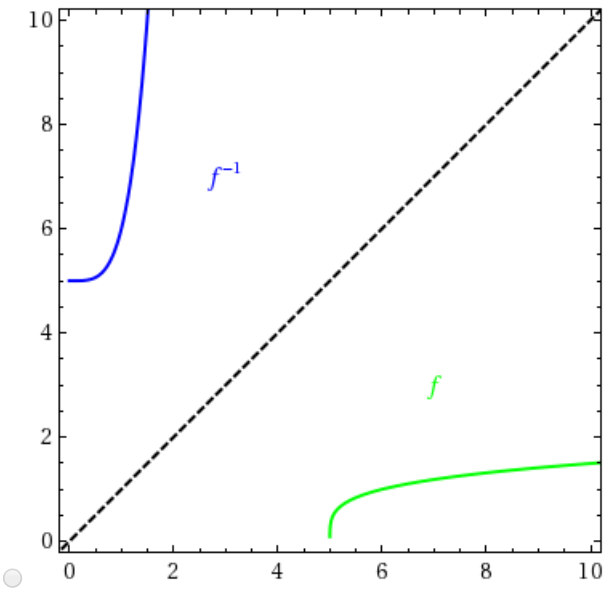
$$f(x) = x^4 + 5, \quad x \geq 0$$

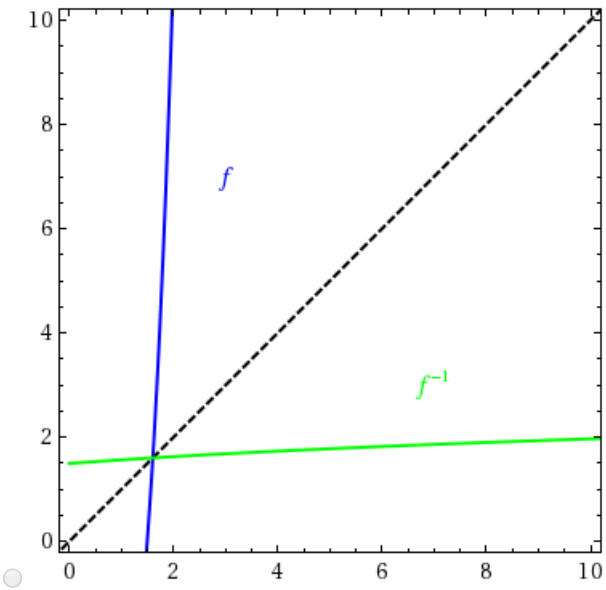
Find an explicit formula for f^{-1}.

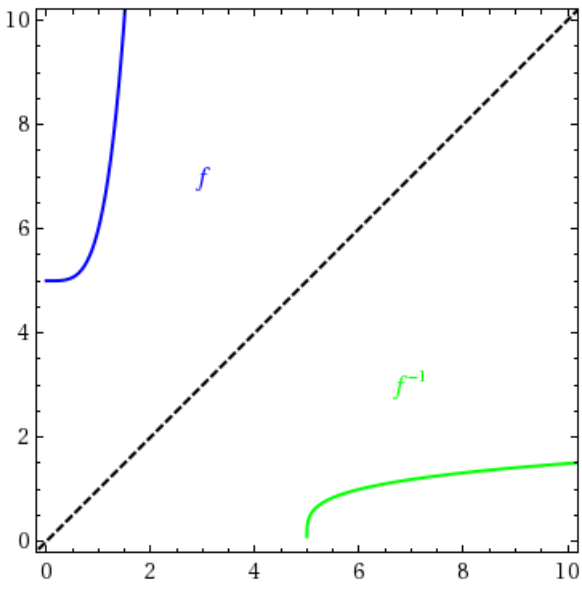
$f^{-1}(x) =$

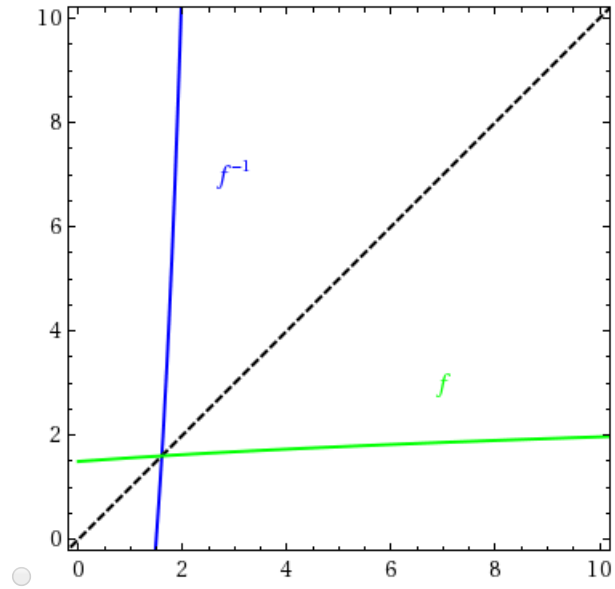
$$\sqrt[4]{x-5}$$

Graph f^{-1}, f, and the line $y = x$ on the same screen. To check your work, see whether the graphs of f and f^{-1} are reflections about the line.





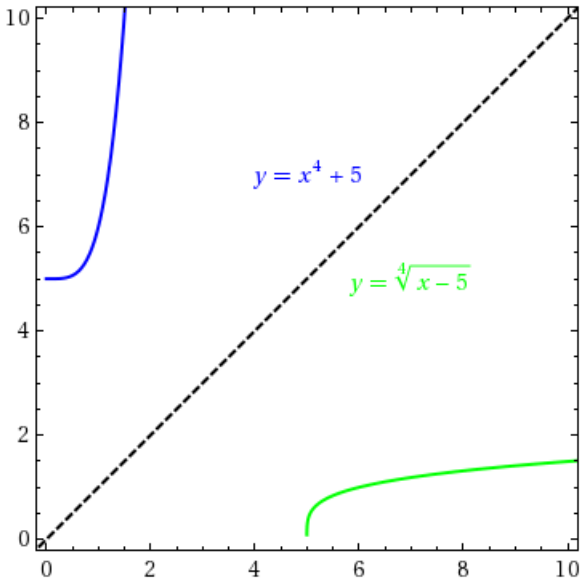




Solution or Explanation

$y = f(x) = x^4 + 5 \Rightarrow y - 5 = x^4 \Rightarrow x = \sqrt[4]{y-5}$ [not ± since $x \geq 0$]. Interchange x and y: $y = \sqrt[4]{x-5}$. So $f^{-1}(x) = \sqrt[4]{x-5}$. The graph of $y = \sqrt[4]{x-5}$ is just the graph of $y = \sqrt[4]{x}$ shifted right five units. From the graph, we see that f and f^{-1} are reflections

about the line $y = x$.



10. 2/2 points | Previous Answers SCalc8 6.1.JIT.004.MI.

Use the Inverse Function Property to see if f and g are inverses of each other.

$$f(x) = \frac{9 - x}{10}, \quad g(x) = -10x + 9$$

$f(g(x)) = f($ $$-10x+9 [ ] ✔ $-10x + 9$ $)$

$= \dfrac{9 - ($ $$-10x+9 [ ] ✔ $-10x + 9$ $)}{10}$

$= \dfrac{$$10x [ ] ✔ $10x$}{10}$

$=$ $$x [ ] ✔ x for all x.

$g(f(x)) = g($ $$9-x10 [ ] ✔ $\dfrac{9 - x}{10}$ $)$

$= -10 \cdot ($ $$9-x10 [ ] ✔ $\dfrac{9 - x}{10}$ $) + 9$

$=$ $$-90+10x10 [ ] ✔ $x - 9$ $+ 9$

$=$ $$x [ ] ✔ x for all x.

Thus, f and g are ✔ are inverses of each other.

11. 2/2 points | Previous Answers SCalc8 6.1.AE.004.

Video Example

EXAMPLE 4 Find the inverse function of

$f(x) = x^3 + 3, \quad 0 \le x < \infty$

SOLUTION According to this outline We first write

$y = x^3 + 3$.

Then we solve this equation for x.

$x^3 =$ $$y−3

✔ $y - 3$

$x = \sqrt[3]{}$ $$y−3

✔ $y - 3$

Finally, we interchange x and y.

$y =$

$$\sqrt[3]{}x−3

✔ $\sqrt[3]{x - 3}$

Therefore the inverse function is

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

$$\sqrt[3]{}x−3

✔ $\sqrt[3]{x - 3}$.