

Unit 8 Quick Quiz

$$\sqrt[5]{5} =$$

$$\sqrt{5} \cdot \sqrt{3} =$$

$$5^3 =$$

$$\sqrt{\frac{18}{25}} =$$

$$\sqrt[3]{64} =$$

$$36^{\frac{1}{2}} =$$

Mar 21-10:19 AM

8-5 Inverse Functions

Objectives:

-I can find the inverse of a given function

-I can verify that an inverse is a function

Jan 5-9:08 PM

Inverse of a Relation

The **inverse of a relation** consisting of the ordered pairs (x, y) is the set of all ordered pairs (y, x) .

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

Represents the inverse of the function $f(x)$

Feb 5-11:43 AM

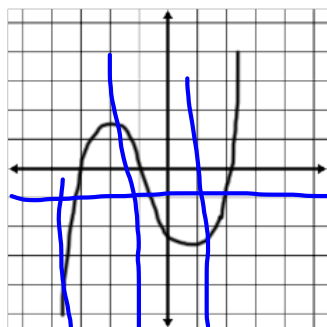
Horizontal-Line Test

The inverse of a function is a function if and only if every horizontal line intersects the graph of the given function (passed the vertical-line test) at no more than one point.

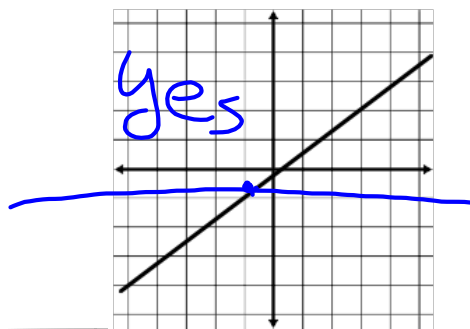
If a function passes both the vertical line test AND the horizontal line test, then it is a **one-to-one** function.

Feb 5-11:44 AM

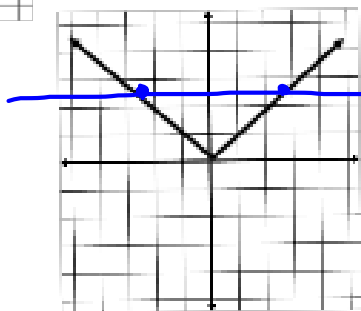
Determine whether the function is one-to-one.



no



yes



no

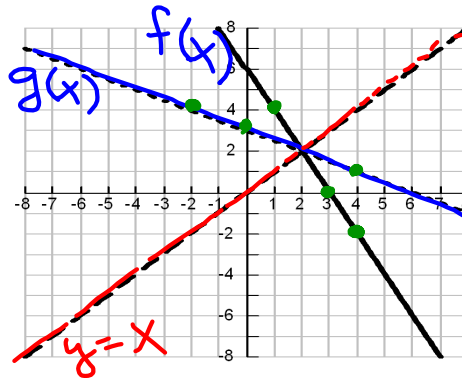
Feb 5-11:44 AM

Inverses - graphically

Inverse relations are reflections of each other over the line $y = x$ (identity function)

Sep 15-7:12 AM

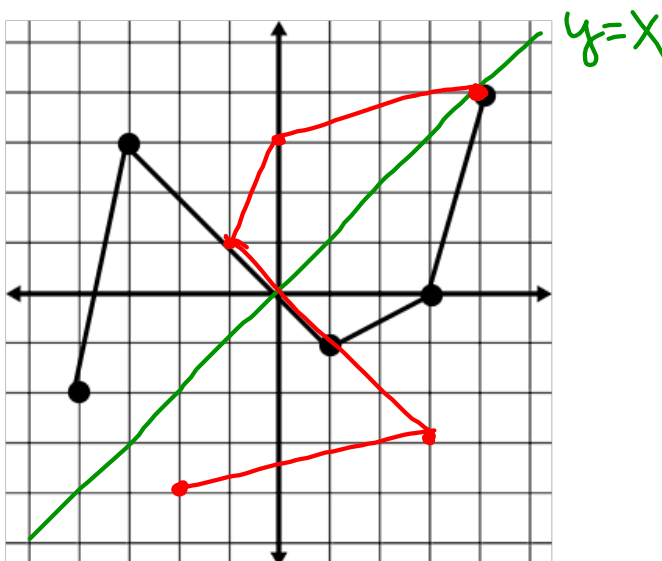
Show $f(x) = 6 - 2x$ and $g(x) = \frac{6-x}{2}$
are inverses graphically



$f(x):$	$(1,4)$	$(3,0)$	$(4,-2)$
$g(x):$	$(4,1)$	$(0,3)$	$(-2,4)$

Sep 15-7:17 AM

Graph the inverse of the graph. (Use $y=x$ to find inverse points)



Feb 24-10:39 AM

To find the inverse equation of a function

1. Change $f(x)$ to y .
2. Interchange x and y
3. Solve for y
4. Change new y to $f^{-1}(x)$

Feb 5-11:44 AM

Given $a^n = b$

If n is odd: $a = \sqrt[n]{b}$

If n is even: $a = \pm \sqrt[n]{b}$

Mar 19-2:39 PM

Find the inverse of each function

$$f(x) = x^2 + 1$$

$$y = x^2 + 1$$

$$x \leftrightarrow y$$

$$x = y^2 + 1$$

Solve for y

$$x - 1 = y^2$$

$$\pm \sqrt{x-1} = y$$

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

$$f^{-1}(x) = \pm \sqrt{x-1}$$

$$g(x) = 2x - 3$$

$$y = 2x - 3$$

$$x \leftrightarrow y$$

$$x = 2y - 3$$

$$x + 3 = 2y$$

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

$$f^{-1}(x) = \frac{x+3}{2}$$

Sep 8-10:34 AM

Find the inverse of each function.
Is the inverse a function?

$$h(x) = 2x^3 + 3$$

$$g(x) = \sqrt[3]{x} - 3$$

$$f^{-1}(x) = \sqrt[3]{\frac{x-3}{2}}$$

$$f^{-1}(x) = (x+3)^3$$

Feb 10-9:51 AM

Find the inverse of each function.
Is the inverse a function?

$$f(x) = 2x + 5$$

$$x = 2y + 5$$

$$x - 5 = 2y$$

$$y = \frac{x-5}{2}$$

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

yes

$$g(x) = \sqrt{x-7}$$

$$x = \sqrt{y-7}$$

$$x^2 = y-7$$

$$y = x^2 + 7$$

$$f^{-1}(x) = x^2 + 7$$

yes

Oct 22-10:23 AM

Find the inverse of each function.
Is the inverse a function?

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

$$x = \sqrt{2y-3}$$

$$x^2 = 2y-3$$

$$x^2 + 3 = 2y$$

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

$$f^{-1}(x) = \frac{x^2+3}{2}$$

yes

$$g(x) = 3x^2 + 2$$

$$x = 3y^2 + 2$$

$$x-2 = 3y^2$$

$$y^2 = \frac{x-2}{3}$$

$$y = \pm \sqrt{\frac{x-2}{3}}$$

no

Sep 8-10:36 AM

Find the inverse of each function.
Is the inverse a function?

$$f(x) = (x+3)^2$$

$$x = (y+3)^2$$

$$\pm\sqrt{x} = y+3$$

$$\boxed{-3 \pm \sqrt{x} = y}$$

no

$$f(x) = (x-5)^3$$

$$x = (y-5)^3$$

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

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

yes

Oct 22-10:22 AM