

Inverse Operations

$+ \leftrightarrow -$

$x \leftrightarrow \div$

$x^2 \leftrightarrow \sqrt{x}$

$x^3 \leftrightarrow \sqrt[3]{x}$

$x^n \leftrightarrow \sqrt[n]{x}$

$x^{\frac{m}{n}} \leftrightarrow x^{\frac{n}{m}}$

$\log_a m = n \leftrightarrow a^n = m$

How to find the inverse of a table

flip x & y

x	f(x)
1	3
2	4
3	5
4	9

notation for function

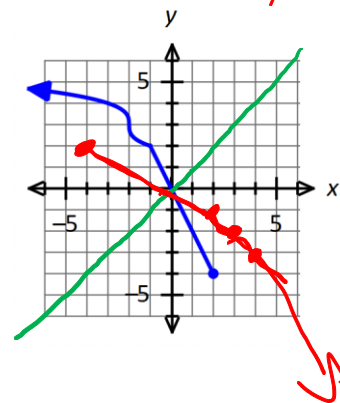
x	f ⁻¹ (x)
3	1
4	2
5	3
9	4

notation for inverse function

How to find the inverse of a graph

reflect over y=x

- $(-3, 4) \rightarrow (4, -3)$
- $(-2, 3) \rightarrow (3, -2)$
- $(2, -4) \rightarrow (-4, 2)$
- $(-1, 2) \rightarrow (2, -1)$



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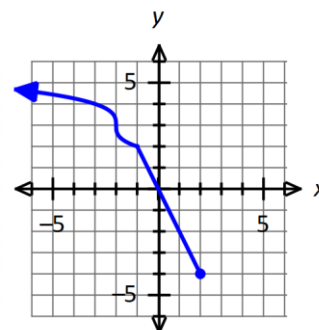
$\log_a m = n \leftrightarrow a^n = m$

How to find the inverse of a table

x	f(x)

x	f ⁻¹ (x)

How to find the inverse of a graph



Steps on how to find the inverse function

- ① flip x & y
- ② get y by itself

ex

$$f(x) = -\sqrt{x+4} - 8$$

$$x = -\sqrt{y+4} - 8$$

$$x+8 = -\sqrt{y+4}$$

$$-x-8 = \sqrt{y+4}$$

$$(-x-8)^2 = y+4$$

$$\boxed{(-x-8)^2 - 4 = f^{-1}(x)}$$

How to prove 2 functions are inverses

ex.

$$f(x) = \frac{3x+5}{2x-1}$$

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

$$\begin{array}{r} 2xy - x = 3y + 5 \\ -3y \quad +x \quad -3y \quad +x \\ \hline 2xy - 3y = x + 5 \end{array}$$

factor

$$y(2x-3) = x+5$$

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

Steps on how to find the inverse function

How to prove 2 functions are inverses