Inverse Functions

Learning Goal: By the end of today, we should be able to create an inverse function graphically and algrebraically.

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When we work with some relationships, it can be difficult to determine which is the independent variable and which is the dependent variable.

At times, we may have to reverse the assignment of independent/dependent variable status to help clarify what information we are trying to understand.

For example:

Several bulk food purchases had the following data.

Mass of Chick Peas (kg)	Cost ($ dollars)
50	60.00
65	78.00
90	108.00
110	132

Determine the slope of this relationship;

What does it mean?

Find the equation of this relationship:

What happens if we switch the column around and change the independent and dependent variables?

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What happens if we switch the column around and change the independent and dependent variables?

Find the new slope and the new equation of the relationship:

What does the new slope represent?

Cost ($ dollars)	Mass of Chick Peas (kg)
60.00	50
78.00	65
108.00	90
132	110

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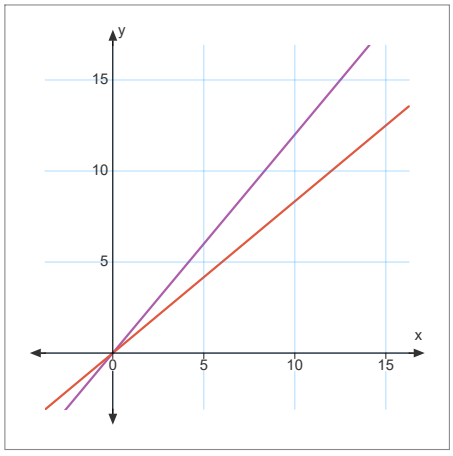
Graphical Comparison

$y = \frac{6}{5}x$

$y = \frac{5}{6}x$

$y = x$



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An inverse function is denoted with the following functional notation (not to be confused with the exponent -1).

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

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Creating an Inverse Function

There are three ways to create an inverse function:

1. Data table - swap the x and y columns

2. Equation - swap the x and y variables, the isolate the new y value

3. Graph the relation and reflect it about y=x axis (diagonal)

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Example - Find the inverse function of following:

f(x) = 3x - 6

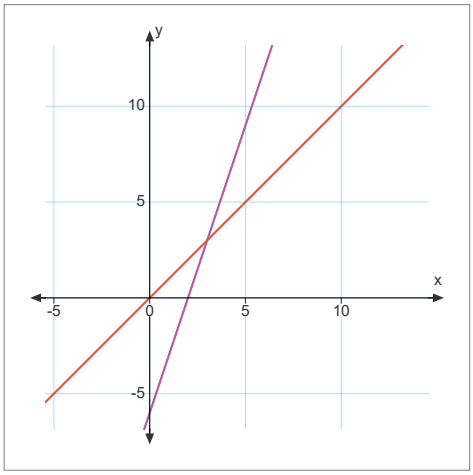
Table of Values

Equation

Graphing

$y = 3x - 6$

$y = x$



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Example - Find the inverse function of following:

$y = \frac{-1}{2}x + 4$

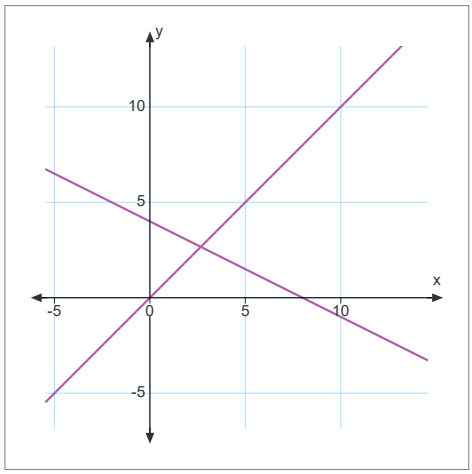
Table of Values

Equation

Graphing

$y = \frac{-1}{2}x + 4$

$y = x$



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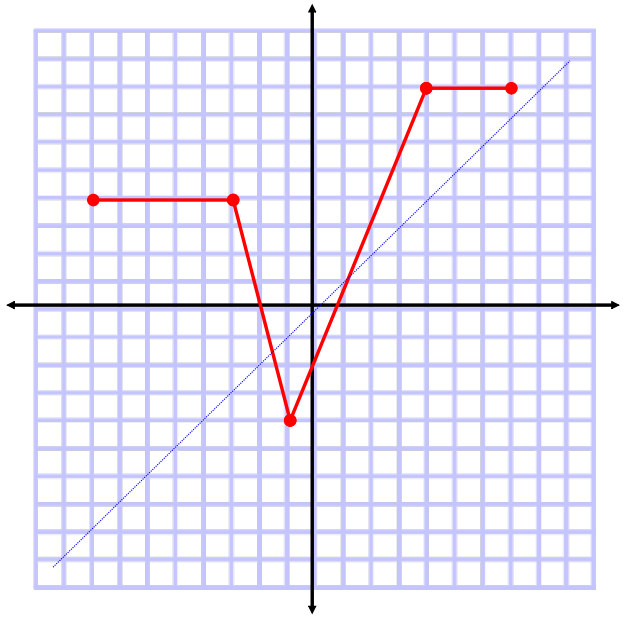
Draw the inverse function for the following:



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Example - Find the inverse function of following:

$y = x^2 - 9$

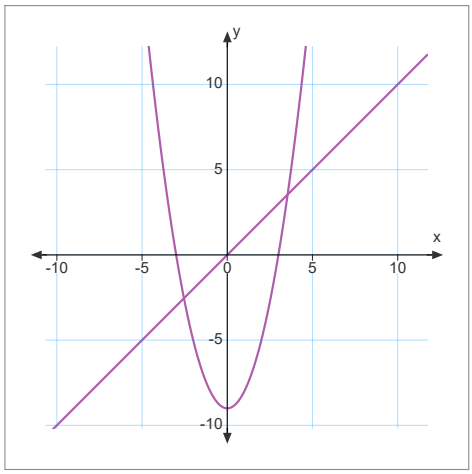
Table of Values

Equation

Graphing

$y = x^2 - 9$

$y = x$



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Invariant points are coordinate locations that are shared by the function and the y=x axis.

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Homework

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