

Algebra 1 4.7

Find the inverse of a relation

Find the inverse of a linear function

relation

inverse - does opposite thing.

function

inverse function

exchange $x \leftrightarrow y$

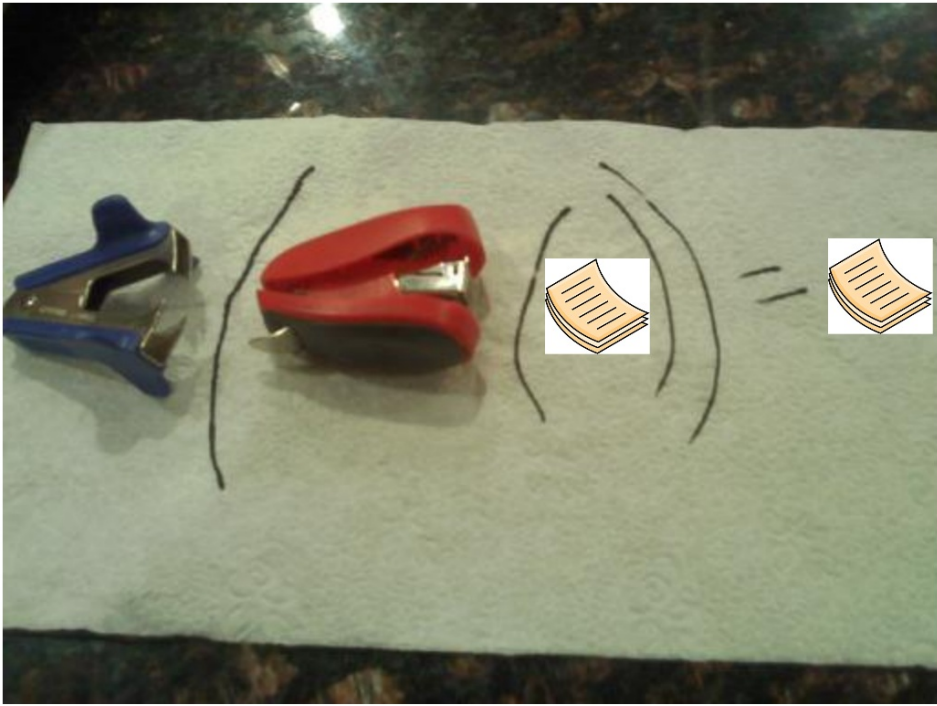
Quiz 4.5-4.6

x domain

y range

$(3,5) \rightarrow (5,3)$

whiteboards



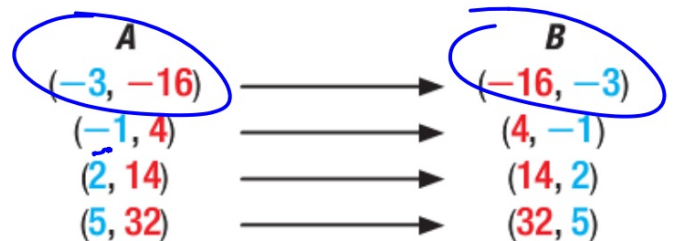
They do the opposite **thing**.... like multiplying and dividing
...not the same as negative...

$$(a, b) \rightarrow (b, a)$$

KeyConcept Inverse Relations

Words If one relation contains the element (a, b) , then the inverse relation will contain the element (b, a) .

Example A and B are inverse relations.



Example 1 Inverse Relations

Find the inverse of each relation.

a. $\{(4, -10), (7, -19), (-5, 17), (-3, 11)\}$ $(-10, 4) \dots$

x	y
3	5

x	y
5	3

x	y

b.

x	-4	-1	5	9
y	-13	-8.5	0.5	6.5

$$\begin{array}{l|l} & -13 \\ \hline & -4 \end{array}$$

Guided Practice

1A. $\{(-6, 8), (-15, 11), (9, 3), (0, 6)\}$

1B.

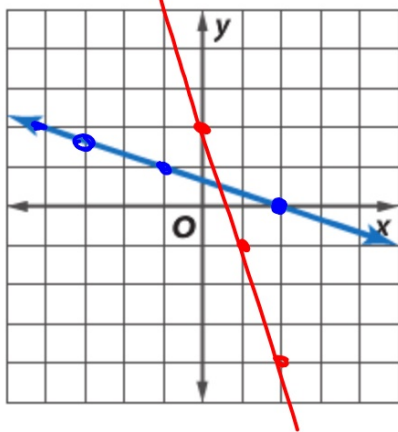
<i>x</i>	-10	-4	-3	0
<i>y</i>	5	11	12	15

Guided Practice

Graph the inverse of each relation.

2A.

$(2, 0)$
 $(-1, 1)$
 $(-4, 2)$

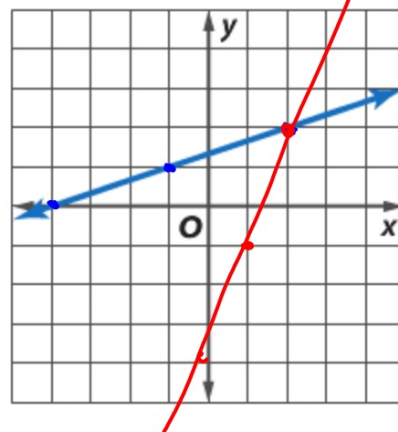


Exchange ordered pairs
(How can I get some from the graph?)

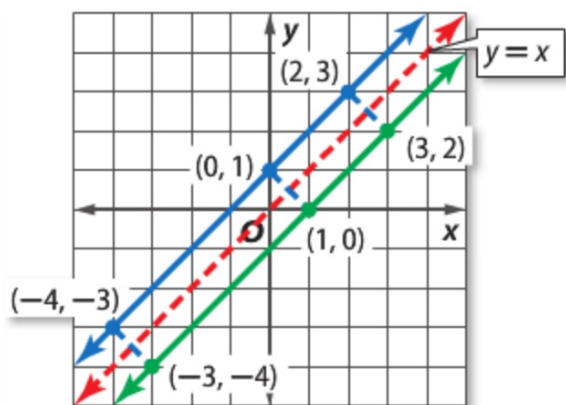
Line of symmetry

2B.

$(-1, 1)$
 $(-4, 0)$



where is $y=x$?



inverse: reflection over $y=x$

p. 267
 1-4 } all
 8-13 }

Writing equations:
slope-intercept form

function form

KeyConcept Finding Inverse Functions

To find the inverse function $f^{-1}(x)$ of the linear function $f(x)$, complete the following steps.

Step 1 Replace $f(x)$ with y in the equation for $f(x)$.

Step 2 Interchange y and x in the equation.

Step 3 Solve the equation for y .

Step 4 Replace y with $f^{-1}(x)$ in the new equation.

Remember: x and y trade places...

To consider: "What is happening to x ? What would be the opposite thing?"
...so I should expect to see....

Example 3 Find Inverse Linear Functions

Find the inverse of each function.

a. $f(x) = 4x - 8$

b. $f(x) = -\frac{1}{2}x + 11$

Guided Practice

3A. $f(x) = 4x - 12$

3B. $f(x) = \frac{1}{3}x + 7$