Algebra 1 4.7

Quiz 4.5-4.6 (Graphing calculators)

opposite

Find the inverse of a relation

Find the inverse of a ~~linear~~ function

relation (x, y)

inverse (y, x)

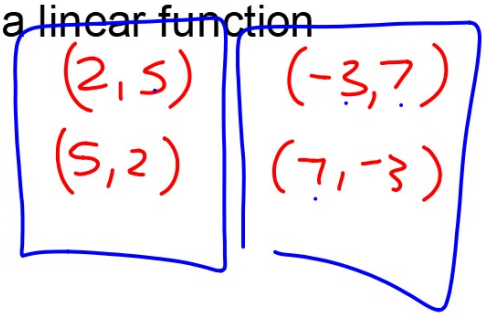
function

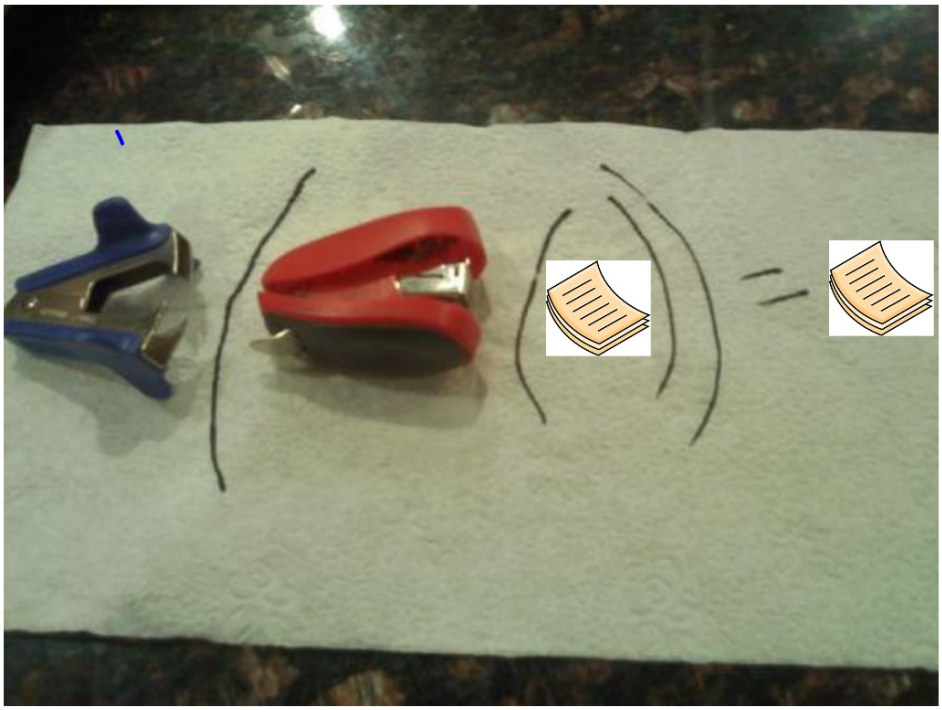
inverse function

domain → x

range → y

whiteboards





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

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.

A		B
$(-3, -16)$	→	$(-16, -3)$
$(-1, 4)$	→	$(4, -1)$
$(2, 14)$	→	$(14, 2)$
$(5, 32)$	→	$(32, 5)$

Example 1 Inverse Relations

Find the inverse of each relation.

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

$(-10, 4)$ $(-19, 7)$ $(17, -5)$ $(11, -3)$

b.

x	−4	−1	5	9
y	−13	−8.5	0.5	6.5

$(-4,-13)$ $(-1,-8.5)$ ↓ ↓

$(13,-4)$ $(-8.5,-1)$

GuidedPractice

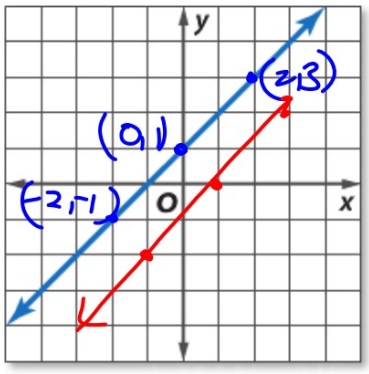
1A. $\{(-6, 8), (-15, 11), (9, 3), (0, 6)\}$

1B.

x	−10	−4	−3	0
y	5	11	12	15

Example 2 Graph Inverse Relations

Graph the inverse of the relation.



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

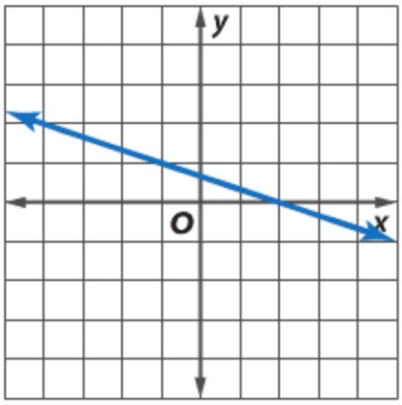
Line of symmetry

p. 267 1-4
8-13

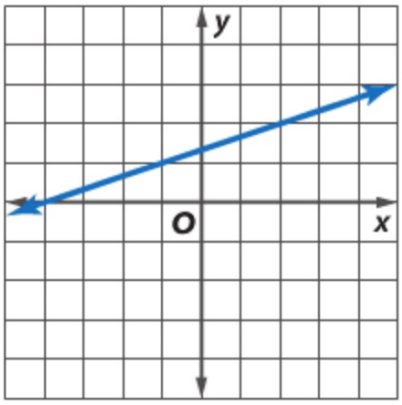
GuidedPractice

Graph the inverse of each relation.

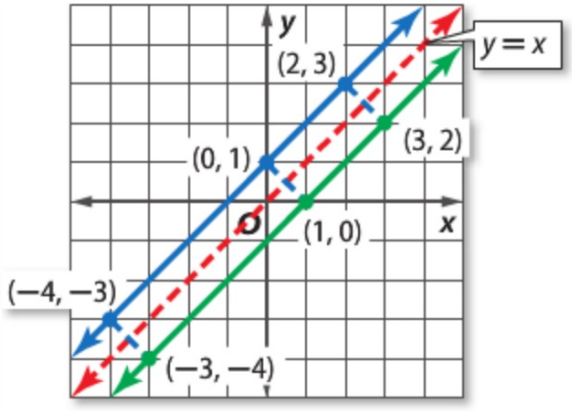
2A.



2B.



where is y=x?



inverse: reflection over y=x

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

GuidedPractice

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

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