Grab a Week #5 Packet

Monday 9/16

$Ax+By=C$

1) Identify the x and y intercepts of the line x – 4y = - 8

x-intercept: -8 $(-8,0)$ y-intercept: 2 $(0,2)$

x	y
-8	0
0	2

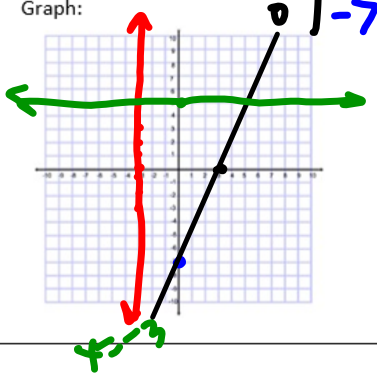
2) Identify the x and y intercepts of the line 7x – 3y = 21, then graph it

$\frac{-3y}{-3} = \frac{21}{-3}$

x-intercept: 3 $(3,0)$ y-intercept: $(0,-7)$ -7

x	y
3	0
0	-7

Graph:



3) Graph x = - 3 and y = 5 on the same coordinate plane.

V U x=-3 H O Y

4) Write y = 1/3x + 7 in standard form using $\boxed{\text{integers.}}$

$-\frac{1}{3}x \quad -\frac{1}{3}x$

$$3\left(-\frac{1}{3}x + y = 7\right)$$

$$\underline{-1x} + \underline{3y} = \underline{21}$$

Week #4 Packet due tomorrow

Ch 3 Test Thursday

Essential Question

How does the graph of the linear function $f(x) = x$ compare to the graphs of $g(x) = f(x) + c$ and $h(x) = f(cx)$?

$f(x) = 2x - 5$

$y = 2x - 5$

Do together: The graph of *f*(*x*) = *x* is shown. Sketch the graph of each function g(x), along with *f*, on the same set of coordinate plane.

y = x

What can you conclude?

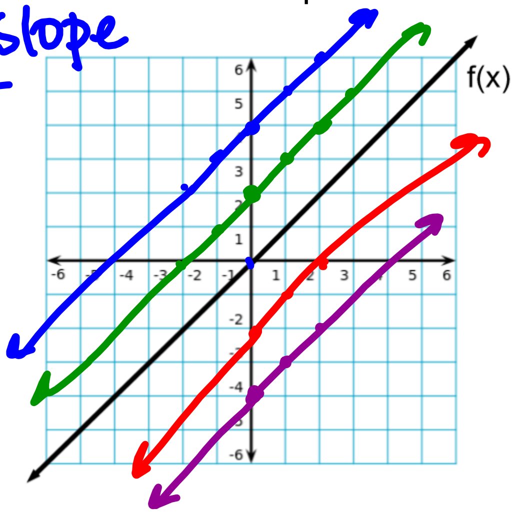
same slope
dif y-int

a. $g(x) = x + 4$

b. $g(x) = x + 2$

c. $g(x) = x - 2$

d. $g(x) = x - 4$



Work with a partner. Sketch the graph of each function h(x), along with $f(x) = x$, on the same set of coordinate plane. What can you conclude?

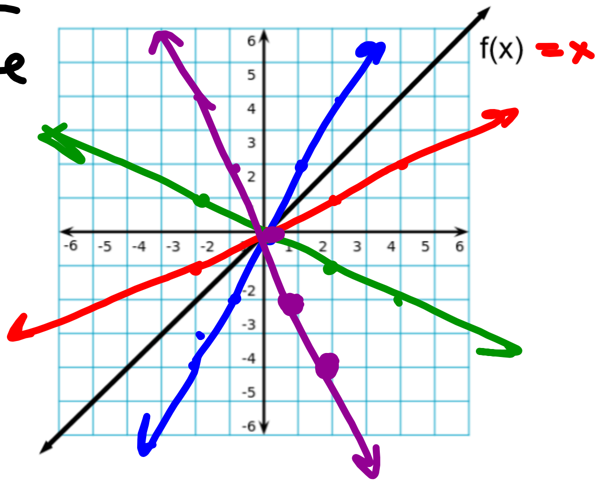
same y-int
dif slope

a. $h(x) = \frac{1}{2}x$

b. $h(x) = 2x$

c. $h(x) = -\frac{1}{2}x$

d. $h(x) = -2x$



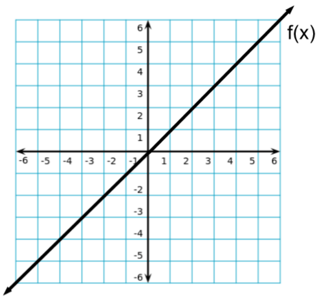
Discuss as a class. Match each function with its graph. Then use the results of Explorations 1 and 2 to compare the graphs of *k(x)* to the graph of *f*(*x*) = *x*.

1. $k(x) = 2x - \underline{4}$ C

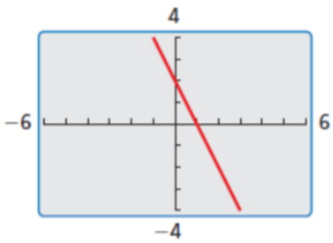
2. $k(x) = -2x + 2$ A

3. $k(x) = -\frac{1}{2}x \underline{- 2}$ B

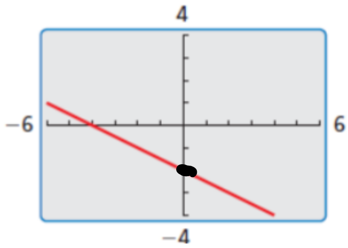
4. $k(x) = \frac{1}{2}x + 4$ D



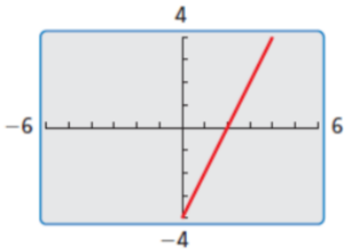
A.



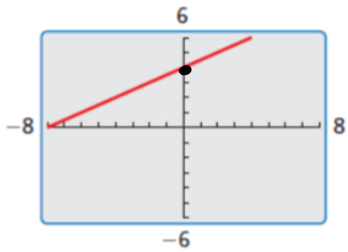
B.



C.

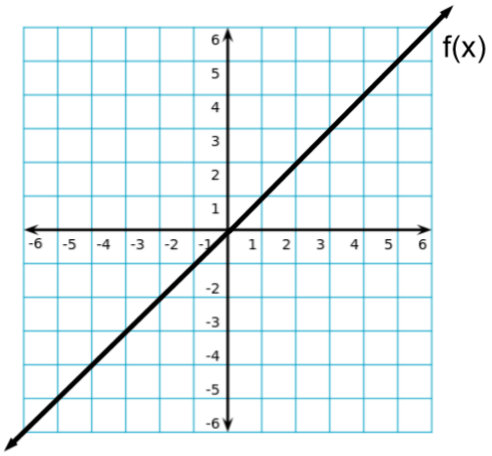


D.



f(x) = x is the PARENT FUNCTION for all nonconstant linear functions

A family of functions w/ similar characteristics has a most basic function...



Translation: A transformation that shifts a graph vertically______ or horizontally______ but does not change the size, shape or orientation of the graph

Vertical Translations: f(x) --> f(x) + k

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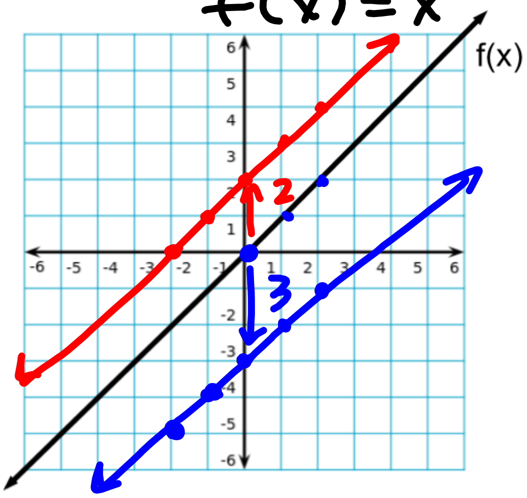
Fill in the table and graph g(x) and h(x)

$g(x) = f(x)+2$ $\qquad$ $h(x) = f(x)-3$

inputs (outputs)

x	f(x)	g(x)	h(x)
-2	-2	0	-5
-1	-1	1	-4
0	0	2	-3
1	1	3	-2
2	2	4	-1

$f(x) = x$



Horizontal Translations: f(x) --> f(x-h)

Fill in the table and graph g(x) and h(x)

$g(x) = f(x+2)$ $h(x) = f(x-3)$

x	f(x)	g(x)	h(x)
-2	-2	0	
-1	-1	1	
0	0		
1	1		
2	2		

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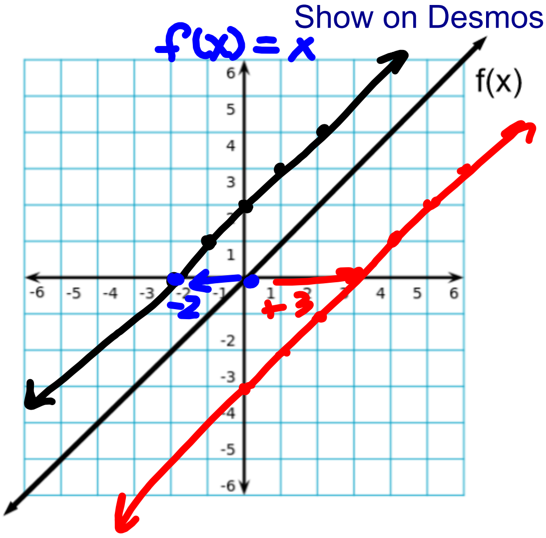
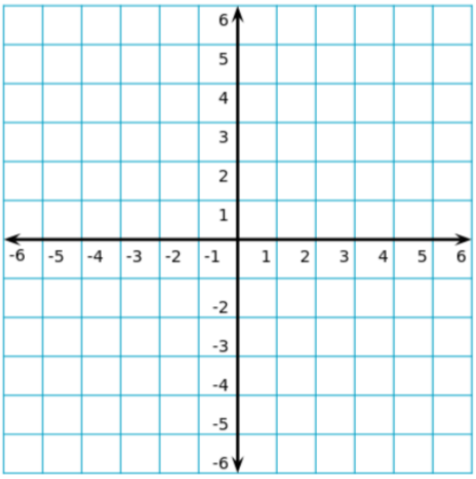


Let $f(x) = 2x - 1$.



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Graph:

$g(x) = f(x) + 3$ and $t(x) = f(x + 3)$.

Describe the transformations from the graph of f to the graphs of g and t.

Describe the transformation made to the function f(x).

$g(x) = f(x) + \underline{6}$

up 6

$g(x) = f(x - 1)$

right 1

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

down 3

$g(x) = f(x + 7)$

left 7

$g(x) = f(x - 2) + \underline{4}$

right 2, up 4

$g(x) = f(x - 5) - \underline{10}$

right, 5, down 10

x-(-9)

$g(x) = f(x + 9) + 1$

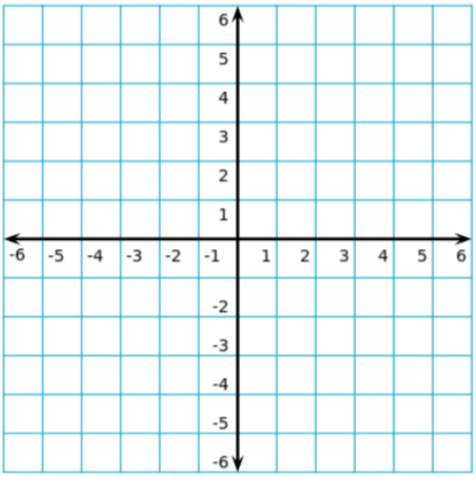
left 9, up 1

$g(x) = f(x + 2) + 8$

left 2, up 8

Reflection: A transformation that flips a graph across a line called a *line of reflection.*

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



Graph $g(x) = -f(x)$ and $t(x) = f(-x)$.

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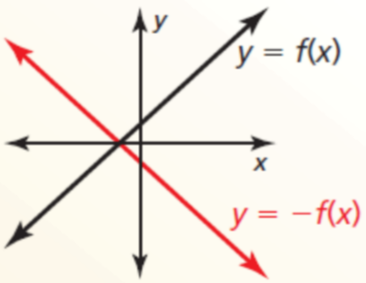
Describe the transformations from the graph of *f* to the graphs of *g* and *t*.

x	f(x)	g(x)	t(x)

Reflections in the *x*-axis

The graph of $y = -f(x)$ is a reflection in the x-axis of the graph of $y = f(x)$.



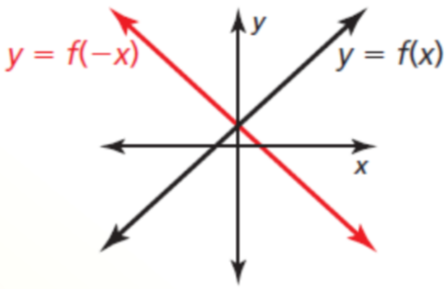
Multiplying the outputs by -1 changes their signs.

Reflection over the x-axis

$y = -f(x)$

Reflections in the *y*-axis

The graph of $y = f(-x)$ is a reflection in the y-axis of the graph of $y = f(x)$.



Multiplying the inputs by -1 changes their signs.

Reflection over the y-axis

$y = f(-x)$

Describe the transformations from the graph of *f* to the graphs of *g* and *h*.

1. $\boxed{f(x) = 3x + 1}$

$g(x) = f(x) - 2$ ↓ 2

$h(x) = f(x - 2)$ → 2

2. $\boxed{f(x) = -4x - 2}$

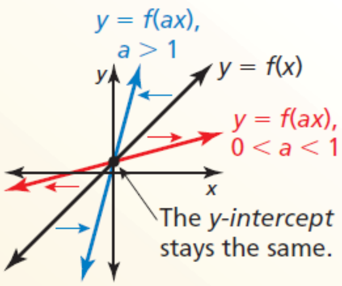
$g(x) = -f(x)$ reflect over x

$h(x) = f(-x)$ reflect over y

Core Concept

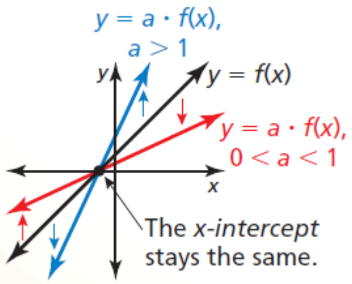
Horizontal Stretches and Shrinks

The graph of $y = f(ax)$ is a horizontal stretch or shrink by a factor of $\frac{1}{a}$ of the graph of $y = f(x)$, where $a > 0$ and $a \neq 1$.



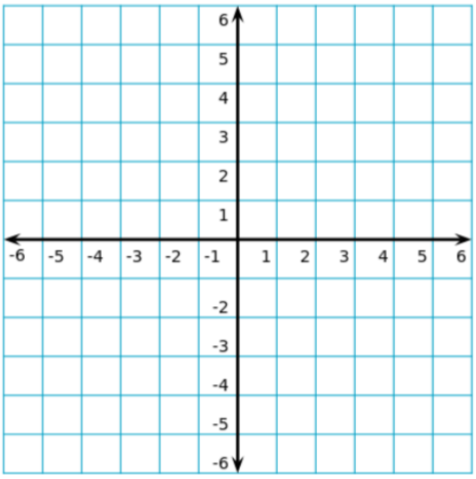
Vertical Stretches and Shrinks

The graph of $y = a \cdot f(x)$ is a vertical stretch or shrink by a factor of a of the graph of $y = f(x)$, where $a > 0$ and $a \neq 1$.



Let $f(x) = x - 1$

Graph $g(x) = f\left(\frac{1}{3}x\right)$ and $h(x) = 3f(x)$.



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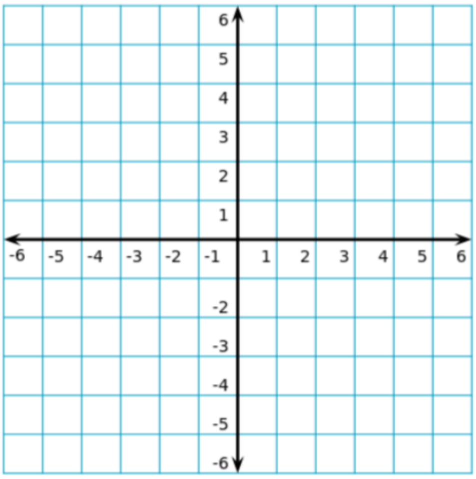
Describe the transformations from the graph of *f* to the graphs of *g* and *h*.

Let $f(x) = x + 2$



Graph $g(x) = f(4x)$ and $h(x) = \frac{1}{4} f(x)$.

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Describe the transformations from the graph of *f* to the graphs of *g* and *h*.

Describe the transformations from the graph of *f* to the graphs of *g* and *h*.

$\boxed{f(x) = 4x - 2;}$ $g(x) = f\left(\overset{a}{\frac{1}{2}}x\right);$ $h(x) = \underline{2}f(x)$

H-stretch by a factor of 2. $\left(\frac{1}{1/2}\right)$

vertical stretch by a factor of 2

$\boxed{f(x) = -3x + 4;}$ $\underline{g(x) = f(2x);}$ $h(x) = \underline{\frac{1}{2}}f(x)$

Hor. shrink by a factor of 1/2

vertical shrink by factor of 1/2

3.6 Day 1 - Transformations of Linear Functions

Pg 151-154 #s 1, 3, 5, 9, 13, 17, 21, 25, 29, 33, 36, 38, 63, 72-74