

transformations: Changing b

agenda

Warm-Up

HW Check

Notes p. 44

HW: Practice
#1-4

reminders

HW 2.4 due Friday

TEST & Notebook
Check Tuesday

essential question

What happens
to the line
when I change
the "b" value
of an equation?

Warm-Up Wednesday

There is an iPad at each table. The app you need is already open!!

Work through the half-sheet of paper #1-9!

test Corrections

1. Watch videos (will be showing at 4:20 in C204)
2. Come to tutoring
3. Work other problems
4. SHOW YOUR WORK!!!
5. Raises your average!!



Slope-Intercept Form of Equations

Desmos link: [goo.gl/kTQu2i](https://www.desmos.com/calculator/kTQu2i)

Slope is the m and steepness of a line.

The **y-intercept** is where a line crosses the y-axis.

Exploring slope

Look at the graph on the iPad.

1. What is the value of the slope?

1

2. What does this tell you about the direction and steepness of the line?

UP,

Drag the slider for m to the right.

3. How does increasing the slope change the line?

steeper

Drag the slider for m to the left until $m = 0$.

4. How does decreasing the slope change the line?

flatter

5. What does the line look like when $m = 0$?

flat, horizontal

Continue dragging the slider for m to the left.

6. How is the direction of the line different when m is negative than when it was positive?

7. How is the line changing as the slope decreases?

reflect
steeper

Exploring the y-intercept

Drag the slider for b to the right.

8. How does increasing b change the line?

moves UP

Drag the slider for b to the left.

9. How does decreasing b change the line?

moves down

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Warm-Up Wednesday

Which table shows a linear relationship that is parallel to the equation $y = -\frac{2}{3}x + 2$?

A.	X	Y
	-6	-2
	-3	0
	0	2
	3	4

B.	X	Y
	-6	5
	-3	3
	0	1
	3	-1

C.	X	Y
	-6	10
	-4	7
	-2	4
	0	1

D.	X	Y
	-6	-8
	-4	-5
	-2	-2
	0	1

questions, comments, concerns?

Algebra 1 - Unit 3: Topic 2 – Changes of m

Practice – Changes in Slope (m)

Name _____ Date _____ Period _____

- Describe the change of the graph of $y = x$ if the equation changes to $y = \frac{3}{5}x$.
 - The new line is steeper.
 - The new line is less steep.
 - The new line shifts up $\frac{3}{5}$ units.
 - The new shifts down $\frac{3}{5}$ units.
- Describe the change of the graph of $f(x) = x$ if the equation changes to $g(x) = 4x$.
 - The line $g(x)$ is the same.
 - The new line is decreasing and four times as steep.
 - The new line is increasing and four times as steep.
 - The new line is horizontal.
- Without using a calculator, describe the change of the graph of $y = x$ if the equation changes to $y = -\frac{1}{3}x$.
 - The graph is increasing but is flatter.
 - The graph is increasing and steeper.
 - The graph is decreasing and flatter.
 - The graph is decreasing and steeper.
- What would be the equation of the line $g(x)$ if the line $f(x) = x + 4$ becomes flatter by a scale factor of $\frac{1}{2}$?
 - $g(x) = x - \frac{1}{2}$
 - $g(x) = -\frac{1}{2}x + 4$
 - $g(x) = x + \frac{1}{2}$
 - $g(x) = \frac{1}{2}x + 4$
- What would be the equation of the line $g(x)$ if the line $f(x) = x$ becomes three times steeper and is reflected?
 - $g(x) = x + 3$
 - $g(x) = x - 3$
 - $g(x) = -3x$
 - $g(x) = 3x$
- Choose all of the following options that describe the change(s) of the graph of $f(x) = 2x$ if the equation changes to $g(x) = -4x$.
 - The line $g(x)$ is less steep
 - The line $g(x)$ is reflected
 - The line $g(x)$ is steeper
 - The line $g(x)$ is shifted down.
- Given the two linear equations, decide if each statement is TRUE or FALSE.

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

$$g(x) = -5x + 3$$

_____ $f(x)$ and $g(x)$ are parallel.

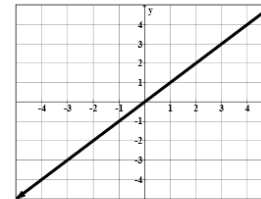
_____ $f(x)$ and $g(x)$ are perpendicular.

_____ $g(x)$ is steeper than $f(x)$.

_____ $f(x)$ is decreasing.

_____ $g(x)$ is decreasing.

8. The graph below represents the parent function $y = x$.

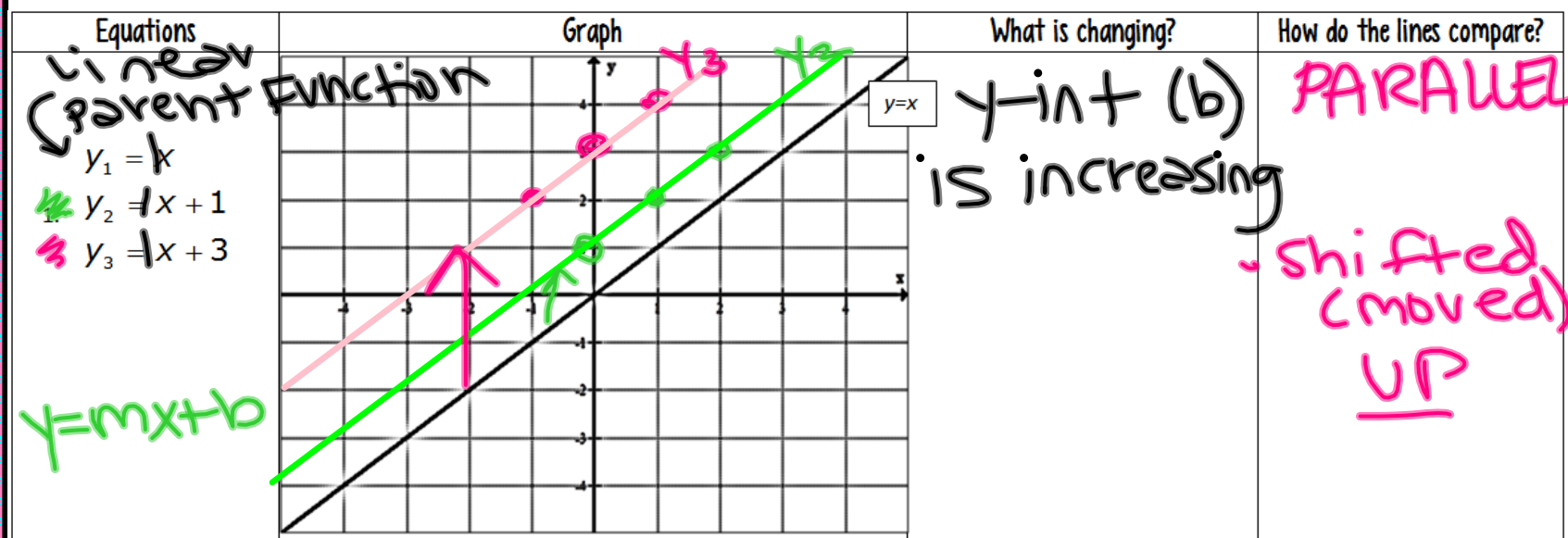


- A) From the equation above, if the slope is changed to -2 , what is the equation of the new line?
- B) Graph the new line on the graph above.
- C) Describe the transformation from the original line to the new line.

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essential question What happens to the line when I change the "b" value of an equation?

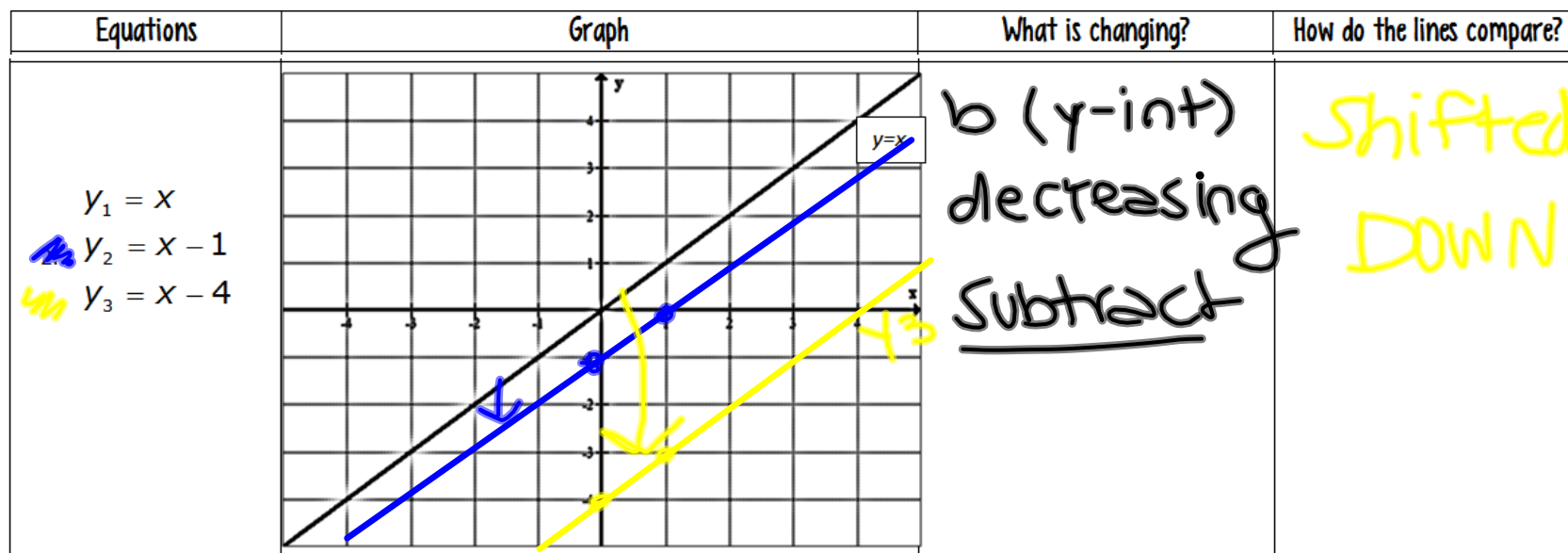
Sketch a graph of the following equations on the same coordinate plane, using a different color for each line.



transformations: Changing b p.44

essential question What happens to the line when I change the "b" value of an equation?

Sketch a graph of the following equations on the same coordinate plane, using a different color for each line.



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essential question What happens to the line when I change the "b" value of an equation?

Sketch a graph of the following equations on the same coordinate plane, using a different color for each line.

Equations	Graph	What is changing?	How do the lines compare?
$y = x$ 3. $f(x) = x$ $g(x) = f(x) + 2$ $h(x) = f(x) - 3$		ADD # → UP SUBTRACT # → DOWN	

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essential question

What happens to the line when I change the "b" value of an equation?

Use this equation for problems 4-7: $f(x) = x - 2$

4. How does this compare to the linear parent function ($f(x) = x$)? _____
5. How would the graph change if the -2 in the equation was changed to a 2? _____
6. What if the -2 was changed to a -6? _____
7. What is the relationship between these two lines? _____

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essential question

What happens to the line when I change the "b" value of an equation?

Summary:

Y-intercept affects: _____

@mskmarh

Algebra 1 Unit 3 Transformations Day 1 (Changes in b)**Practice Transformations Day 1 (Changes in b)**

Name _____ Date _____

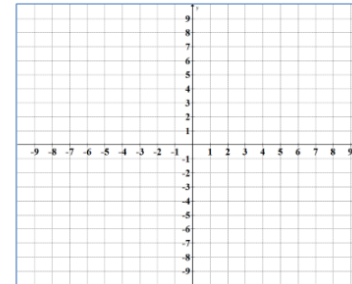
1. For each set of functions below, graph each function in a different color and answer the questions that follow.

$$f(x) = x$$

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

$$f(x) = x - 2$$

- What is changing in each equation?



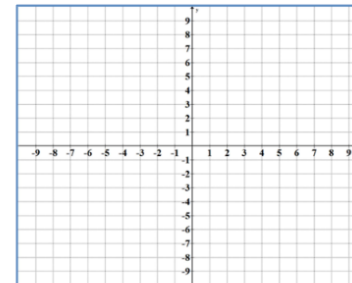
- How do the lines compare to each other?

$$y = -2x + 2$$

b. $y = -2x - 5$

$$y = -2x + 4$$

- What is changing in each equation?



- How do the lines compare to each other?

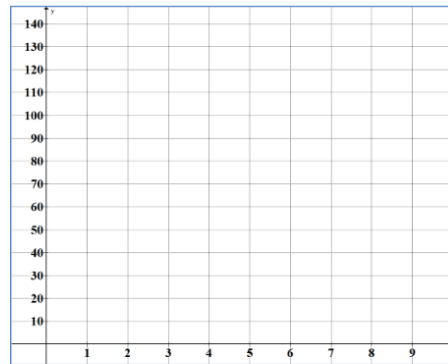
2. Which are **not** an effect on the graph of the parent function $f(x) = x$ for $g(x) = f(x) + 2$?

- I. The graph shifts 2 units down.
- II. The x-intercept moves to (2, 0).
- III. The y-intercept moves to (0, 2).
- IV. The graph shifts 2 units up.

- A I only
- B I, II, III
- C III and IV
- D I and II

Algebra 1 Unit 3 Transformations Day 1 (Changes in b)

3. Luke opens a savings account and decides to put in \$45. He wants to add \$15 to the account each week.
- Write an equation that represents y , the amount of money in Luke's savings, as a function of x , the numbers of weeks since he opened the account.
 - What would the equation be if Luke had put in \$60 when he opened his account?
 - Graph** both equations and **describe** the transformation from part a) to part b).



4. For the function $f(x) = x + 2$,
- How does $f(x) = x + 2$ compare to the linear parent function $f(x) = x$?
 - How would the graph change if the $+2$ in the equation was changed to a $+6$?
 - What if the $+2$ was changed to a -2 ?
 - What is the relationship between these two lines?

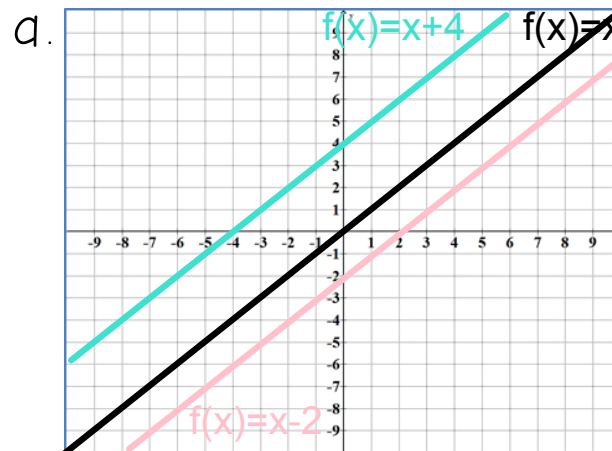
hw help transformations: Changing b

1. Make sure you use color or make your lines look different!

a. • y-intercept (b)

• They are parallel.

b. You try it!!



2. Most important: NOT!! Will a plus move the graph UP or DOWN? Did the x-intercept or y-intercept change?

3. a) $y = 45 + 15x$ b) $y = 60 + 15x$

c) Graph the equations from a & b. What changes on your graph?

4. Plug the new numbers in the equation and compare in your calculator!