Changes to m & b

Agenda

Warm-Up

Notes

Pass back quizzes & quiz corrections

HW: #1-9

Reminders

-Test & Notebook Check (Unit 3) THURSDAY

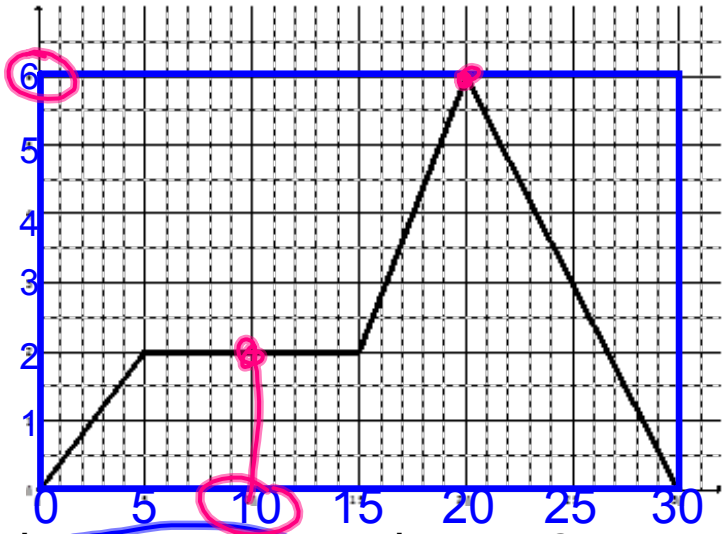
-All HW (2.5, 3.1, 3.2) due FRIDAY

ESSential Question

How does the graph of a linear equation change when the values of m & b change?

Warm-Up Monday

1. Use the following graph to answer:



a. Is the graph continuous or discrete?

b. Find the domain. $\{x \mid 0 \le x \le 30\}$

c. Find the range. $\{y \mid 0 \le y \le 6\}$

d. What is the value of x when f(x) = 6? 20

e. What is the value of f(10)? 2

y = 6

x = 10

Changes to m & b p.55

ESSential Question

How does the graph of a linear equation change when the values of m & b change?

Fold your notes in half, glue the blank side onto page 55. You will need at least 2 colors today!

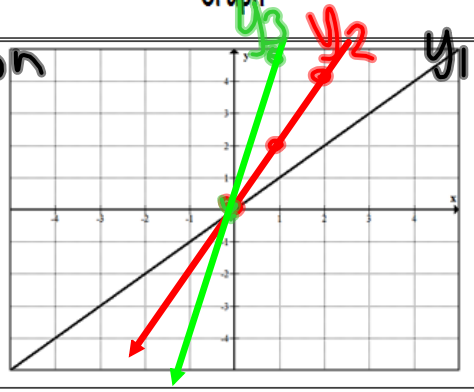
Changes to m & b p.55

Essential Question

How does the graph of a linear equation change when the values of m & b change?

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

$y=mx+b$

Equations	Graph	What is changing?	How do the lines compare to the linear parent function, y=x?
Linear parent function $y_1 = x$ 1. $y_2 = 2x$ $y_3 = 5x$ $b=0$ $m=2$ $b=0$ $m=5$		m → slope increasing	lines are getting steeper

$y=mx+b$

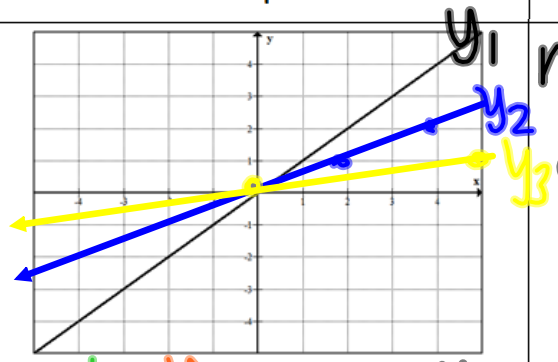
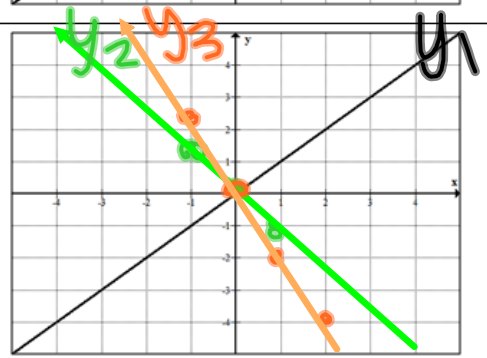
$y=2x+0$

Changes to m & b p.55

Essential Question

How does the graph of a linear equation change when the values of m & b change?

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

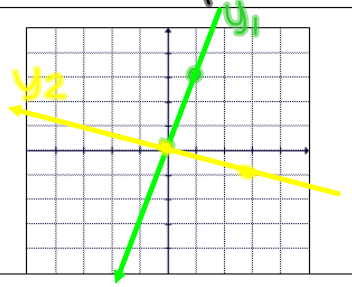
Equations	Graph	What is changing?	How do the lines compare to the linear parent function, y=x?
$y_1 = x$ 2. $y_2 = \frac{1}{2}x$ $y_3 = \frac{1}{5}x$ b=0 b=0 $m=\frac{1}{2}$ $m=\frac{1}{5}$		m→slope decreasing	lines are getting less steep (flatter)
$y_1 = x$ 3. $y_2 = -x$ $y_3 = -2x$		m→slope negative	• decreasing • line reflects (flips) over y-axis

Changes to m & b p.55

ESSential QueStion

How does the graph of a linear equation change when the values of m & b change?

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 to the linear parent function, y=x?
$y_1 = x$ (b=1) $y_2 = x + 1$ (b=3) 4. $y_3 = x - 3$ (b=-4) $y_4 = x + 4$		y-intercept (b-value) Add → UP subtract → DOWN	graph translates (slides/moves) up or down
b=0 m=3/1 $y_1 = 3x$ 5. $y_2 = -\frac{1}{3}x$ b=0 m=-1/3		$m_1 = \frac{3}{1}$ $m_2 = \frac{-1}{3}$ Flip fraction, change sign	How do the lines compare to each other? perpendicular

Perpendicular lines: intersect @ right angles → slopes are FLIPPIN' OPPOSITES

Parallel lines: never touch → same slope

Changes to m & b p.55

Essential Question

How does the graph of a linear equation change when the values of m & b change?

Use this equation for problems 6–9: $y = 2x - 3$

6. How does this compare to the linear parent function ($y = x$) steeper down 3 units
7. How would the graph change if the 2 in the equation from problem 6 was changed to a 5? a lot steeper
8. What if the 2 was changed to a $\frac{1}{2}$? less steep
9. What if the -3 was changed to a 6? moved up

Changes to m & b p.55

Essential Question

How does the graph of a linear equation change when the values of m & b change?

Summary:

Slope affects: steepness of line.
steeper → Big #s / less steep → fractions / negative → flips

Y-intercept affects: beginning point.
Add → moves up / subtract → moves down

Lines that have the same slope are parallel.

Perpendicular lines have slopes that are FLIPPIN' OPPOSITES.

Quizzes & Opportunities

Quiz Corrections (1-time deal, required)

In order to receive half points back on your unit 3 quiz, you must complete this entire assignment. **This is not an optional assignment**. Please staple your original quiz and this paper together. You may get help from any math teacher during tutoring.

Answer the reflection questions in complete sentences, truthfully.

Rework EVERY problem you missed inside the table. Fill out every box!!

Question Number	Topic(s) & notebook page(s) this question covers	Problem re-worked with steps clearly shown	Correct Answer

Notebook Check (Thursday!) Quiz Grade

Use the rubric on page 4 to make sure you will receive a good grade. Don't forget: page numbers, essential questions, & titles, table of contents, ALL pages completed!

Averages

2nd - 56 3rd - 63 4th - 66 5th - 62

All packets (2.5, 3.1, & 3.2) are due Friday - no exceptions.

Algebra I - Unit 3: Topic 2 – Changes of *m* & *b*

Practice – Changes in m & b **pp 357-360**

Name _____ Date _____ Period _____

1. Describe the change of the graph of $y = x$ if the equation changes to $y = \frac{1}{2}x + 9$.

   a. The new line is steeper and shifts up nine.
   b. The new line is less steep and shifts up nine.
   c. The new line is less steep and shifts down nine.
   d. The new line is steeper and shifts down nine.

2. Describe the change of the graph of $y = x$ if the equation changes to $y = 2x$.

   a. The new line is the same.
   b. The new line is decreasing and twice as steep.
   c. The new line is increasing and twice as steep.
   d. The new line is horizontal.

3. Describe the change of the graph of $y = x$ if the *y*-intercept changes to -12.

   a. The graph shifts down twelve units.
   b. The graph shifts up twelve units.
   c. The graph shifts left twelve units.
   d. The graph shifts right twelve units.

4. Without using a calculator, describe the change of the graph of $y = x$ if the equation changes to $y = -\frac{1}{4}x$.

   a. The graph is increasing but is flatter.
   b. The graph is increasing and steeper.
   c. The graph is decreasing and flatter.
   d. The graph is decreasing and steeper.

5. What would be the equation of the line if the line $y = x$ is translated 4 units down?

   a. y = 4x
   b. y = -4x
   c. y = x + 4
   d. y = x – 4

6. What would be the equation of the line if the line $y = x$ is translated 6 units up?

   a. y = x + 6
   b. y = x – 6
   c. y = -6x
   d. y = 6

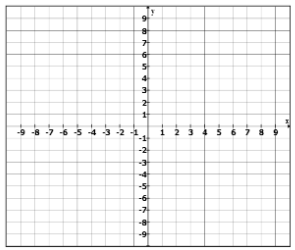
7. What would be the equation of the line if the line $y = x$ becomes two times steeper?

   a. y = x + 2
   b. y = x – 2
   c. y = 2x
   d. y = $\frac{1}{2}$x

8. Without using a calculator, describe the change of the graph of $y = 2x - 3$ if the equation changes to $y = 4x + 3$.

9. Given the two linear equations, decide if each statement is TRUE or FALSE.

$y_1 = 3x - 4$
$y_2 = 3x + 1$



_____ y_1 and y_2 are parallel.

_____ y_1 and y_2 are perpendicular.

_____ y_1 is steeper than y_2.

_____ y_2 is 4 units above y_1.

_____ y_1 is 4 units above y_2.

HW Help - Changes of m & b

GENERAL: Try to graph the first equation in y1 = _____and the second equation in y2 = _____ . Make the 2nd line BOLD so you can check more easily.

Slope (the coefficient of x) changes the line's STEEPNESS. Bigger m - steeper, smaller m - flatter

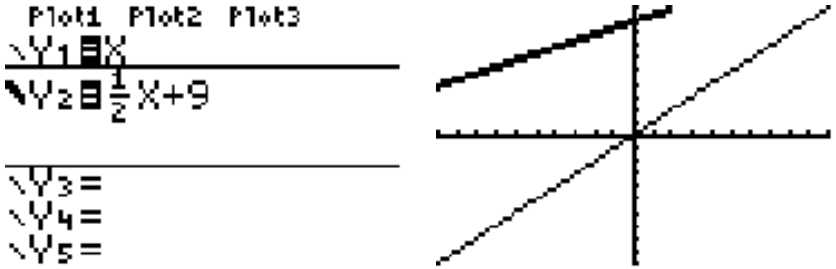
The y-intercept (b) translates (shifts) the graph up or down. ADDING - UP, SUBTRACTING - DOWN.

Negative slopes make a graph decrease.

Parallel lines have the same slope.

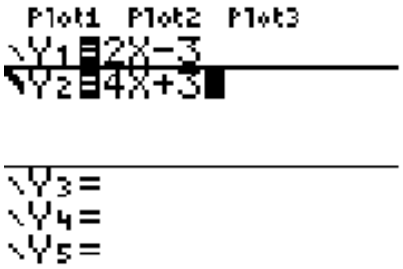
Perpendicular slopes are flippin' opposites.

1.



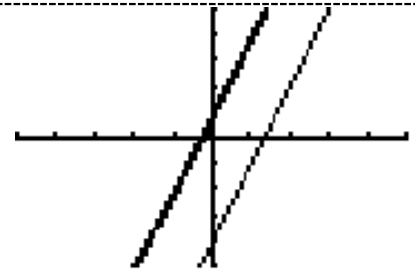
3. We do not shift graphs LEFT or RIGHT.

8.



TWO things will change!

9.



Come to tutorials to check answers.