Applications of Changes in m & b

Agenda

Warm-Up
HW Check
Activity - Graphing Practice
HW: #1 - 13

Reminders

-Test & Notebook Check (Unit 3) THURSDAY
-All HW (2.5, 3.1, 3.2) due FRIDAY
- Please bring an internet-capable device tmr!

Essential Question

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

Warm-Up Tuesday

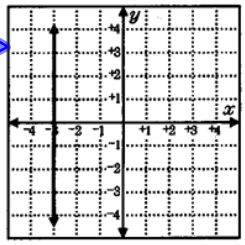
1. Determine which of the following represents a function.
How do you know? There may be more than 1 correct answer.

A. {(10, 20), (20, 30), (30, 20), (30, 40)}

x doesn't repeat

B. {(1, -2), (0, 1), (-2, 2), (3, 4), (-4, 0)}

C.



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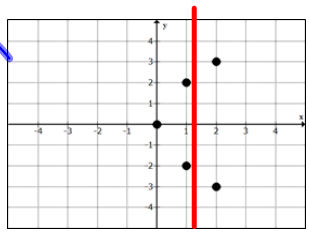

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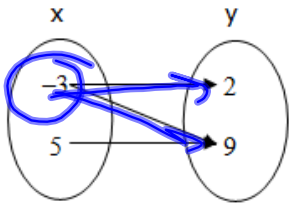

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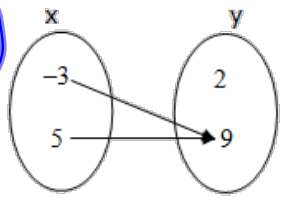


Questions, Comments, Concerns?

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.

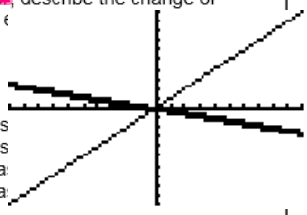
y=mx+b
y= x−12

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 e

   $y = -\frac{1}{4}x$.



   a. The graph is increas
   b. The graph is increas
   c. The graph is decrea
   d. The graph is decrea

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

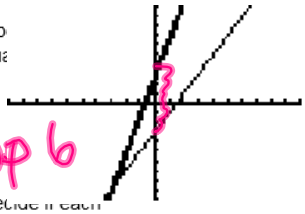
6. What would be the equation of the line if the line $y = x$ is translated 6 units up?

   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

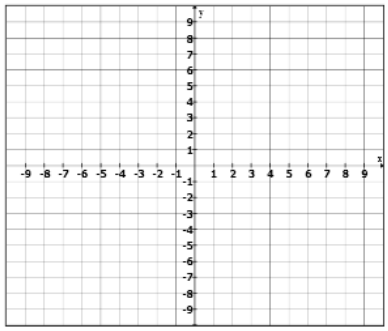
8. ~~Without using a calculator,~~ describ
   the graph of $y = 2x - 3$ if the equa
   $y = 4x + 3$.



• steeper
• translate up 6

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.

Applications of Changes in m & b

Essential Question

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

Linear Transformations & Graphing Practice

Follow the directions on the paper in order to complete the coordinate plane on page 2. Note that you must choose a different equation from everyone at your table.

Please attach your final graph paper to your work space, with lines clearly labeled. Use colors or number each line with the corresponding question number.

Please consult your notebook or team member before asking a teacher. Both pages are due by the end of the period!

When you are done, you may begin tonight's assignment.

Linear Transformations & Graphing Practice Name: _____

1. Start by choosing one of the following equations. **Everyone at your table must choose a different equation.** Circle the one you chose.

$2x+3y=21$	$4x-8y=-16$
$-2x+4y=-20$	$-5x-7y=28$
$-x+3y=9$	$x-2y=12$

ex. $3x-2y=-8$
$-3x \qquad -3x$
$\frac{-2y}{-2}=\frac{-3x-8}{-2}$
$y=\frac{3}{2}x+4$

2. A. Solve your equation for y = $\frac{3}{2}x+4$. Show your work!

$y=mx+b$

B. Identify the slope and y-intercept.

m = $3/2$ b = 4

3. Graph your original line neatly on a sheet of graph paper.

4. Translate your original line up 3 units, write the new equation, and graph on the same coordinate plane.

New equation: $y=\frac{3}{2}x+7$

5. Translate your original line down 5 units, write the new equation, and graph on the same coordinate plane.

New equation: $y=\frac{3}{2}x-1$

6. Reflect your original line over the y-axis, write the new equation, and graph on the same coordinate plane.

New equation: $y=\frac{-3}{2}x+4$

7. Make your original line steeper. To do this you need to increase your slope. Write the new equation and graph on the same coordinate plane.

bigger than original slope

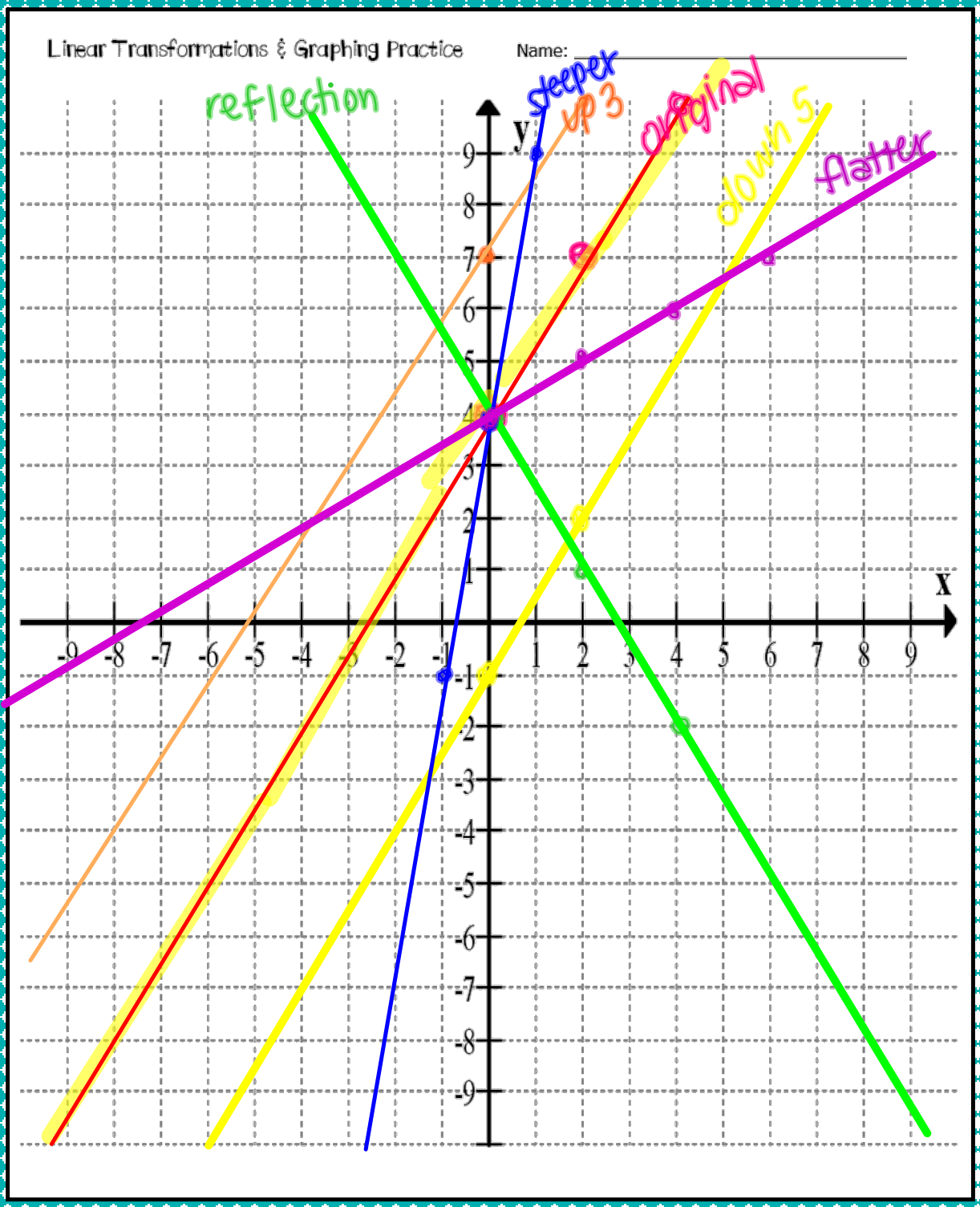
New equation: $y=5x+4$

8. Make your original line less steep. To do this you need to decrease your slope. Write the new equation and graph on the same coordinate plane.

smaller than original slope

New equation: $y=\frac{1}{2}x+4$

Please attach your final graph paper to this one, with lines clearly labeled.


Linear Transformations & Graphing Practice
Name:
reflection
steeper
up 3
original
down 5
flatter
y
x

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

Practice - Application of Changes in m and b

Name _____ Date _____ Period _____

Spending Money

Manuel worked all summer and saved $1090. He plans to spend $30 per week.

1. Make a table of values for the situation

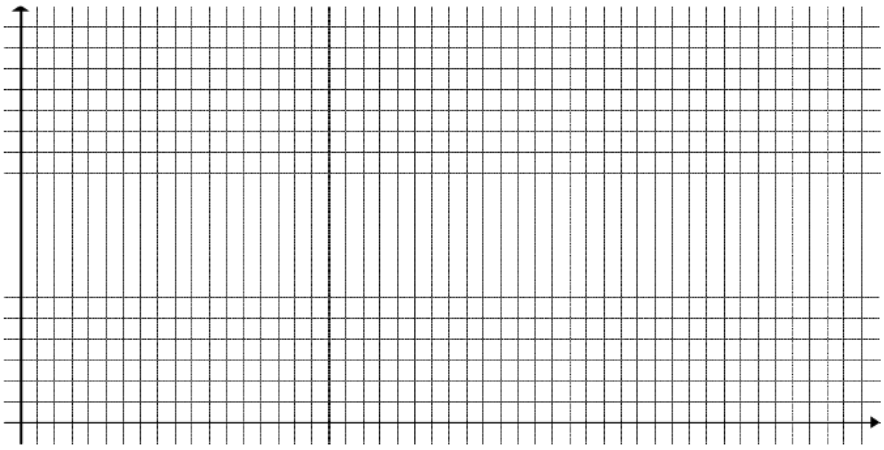
Time (Weeks)	Process	Amount of Money
0		$1090

2. Write a function rule (equation) for the amount of money Manuel will have after t weeks. _____

3. How much money will Manuel have after 11 weeks? _____

4. When will Manuel run out of money? _____

5. Graph the function for the given situation. Label your original line and axes.



6. What is the domain of the situation? _____
   What is the range of the situation? _____

7. a) If Manuel had initially earned $1300 what would be the equation of the line? _____
   b) Graph and label the new line. How does this line compare to the original? _____
   _____
   c) What did not change? _____
   d) What do you know about the two lines? _____

8. How do the graphs of the function $f(x) = x + 9$ and $g(x) = x - 11$ relate to each other?

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

A The graph of $f(x)$ is 2 units above the graph of $g(x)$.
B The graph of $f(x)$ is 20 units above the graph of $g(x)$.
C The graph of $f(x)$ is 2 units to the right of the graph of $g(x)$.
D The graph of $f(x)$ is 20 units to the right of the graph of $g(x)$.

9. How does the graph of $y = 3x + 2$ compare to the graph of $y = 4x + 2$?

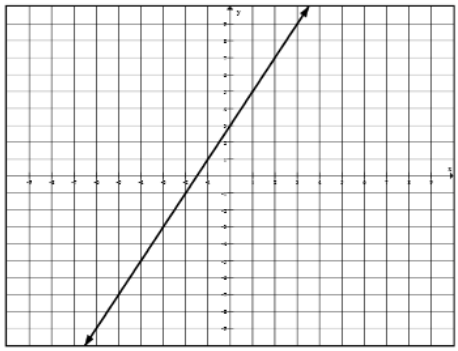
10. If the slope of the equation $y = \frac{-2}{3}x - 4$ is changed to $\frac{2}{3}$ and the y-intercept is changed to (0, 4), which statement best describes this situation?

A The new line is perpendicular to the original line
B The new line is parallel to the original line
C The new line and the original line have the same y-intercept
D The new line and the original line have the same x-intercept

11. Given the function $y = 4.23x - 65.23$, which statement best describes the effect of increasing the y-intercept by 62.15?

A The new line is parallel to the original.
B The new line is has a greater rate of change.
C The x-intercept increases.
D The y-intercept decreases.

12. The graph of a line is shown below. If the slope of this line is multiplied by -1 and the y-intercept decreases by 2 units, which linear equation represents these changes?



A $y = -2x + 1$
B $y = -x + 1$
C $y = -x - 1$
D $y = \frac{-1}{2}x - 1$

13. Tyler wants to buy a video-game system for $375. He can pay for the system in 12 months if he pays $75 now and $25 each month. How will the number of monthly payments be affected if Tyler pays $75 now and $30 each month?

A He will make 10 fewer monthly payments
B He will make 2 fewer monthly payments
C He will make 3 fewer monthly payments
D He will make 5 fewer payments

HW Help: Applications of Changes in m & b #1-13

1.

Time (Weeks)	Process	Amount of Money
0	1090-30(0)	$1090
1	1090-30(1)	$1060
2	1090-30(2)	$1030
3	1090-30(3)	$1000
4	1090-30(4)	$970

2. f(t) = 1090 - 30t

3. t = 11, what is f(t)?

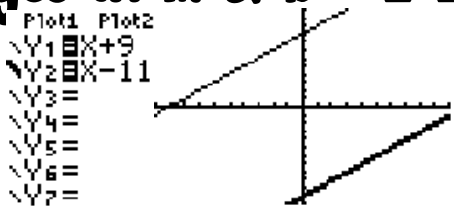
4. f(t) = 0, what is t?

5. x - axis = time, count by 1's

   y - axis = amount of money, count by 100's

6. Look at your graph. Remember DR XY!

8.



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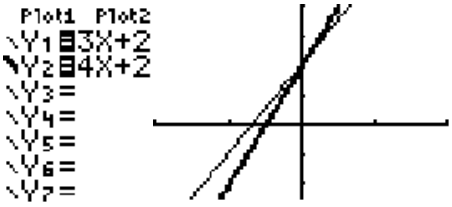

10. New line: y = (2/3)x +4

11. A

12. Write the original equation (m=2 and b=3) then change it.

13. Original: y = 75 + 25x

    New: y = 75 + 30x

How many payments will each option take to get to $375?

Need help on a question not listed? Drop by tutoring to check your answers!