

Objective: You will describe and predict the effects of changes in m and b on the graph of $y = mx + b$

Changes to m & b

$\frac{b}{b}$ You need **FOUR** colors

Agenda

- Warm-Up
- Activity
- Notes
- HW - 1 page

Unit 3 Test

Monday 11/25

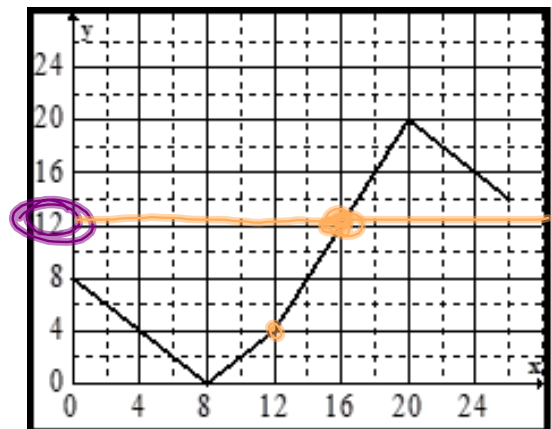
1. Find the slope of the points $(-4, 5)$ and $(2, 1)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 5}{2 - (-4)} = \frac{-4}{6} = -\frac{2}{3}$$

2. Use the graph to find the value or values of x when $f(x) = 12$

$$y = 12$$

$$x = 16$$



Algebra I - Unit 3: Topic 2 - Changes of m & b Student Notes - Changes of m & b

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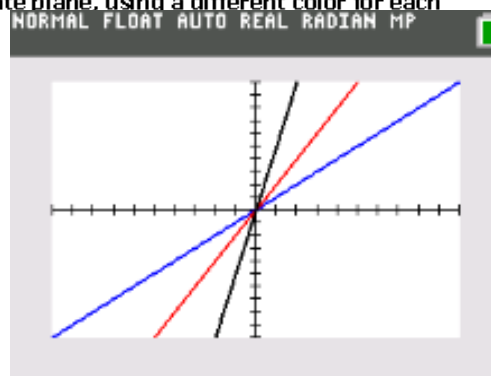
Sketch a graph of the following equations on the same coordinate plane, using a different color for each line.

1. $y_1 = x$ $m=1$
 $y_2 = 2x$ $m=2$
 $y_3 = 5x$ $m=5$

How is the slope (m) changing? increasing

How does each graph compare to the linear parent function, $y = x$?

steeper

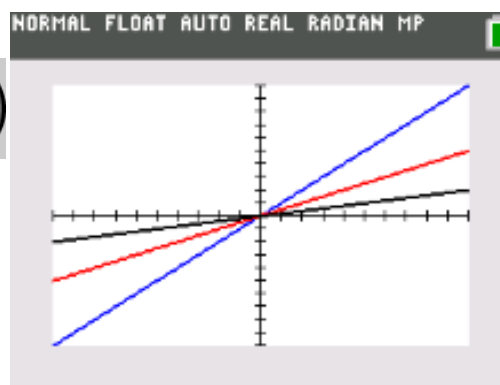


2. $y_1 = x$ $m=1$
 $y_2 = 0.5x$ $m=0.5$
 $y_3 = \frac{1}{5}x$ $m=0.2$

How is the slope (m) changing? decreasing

How does each graph compare to the linear parent function, $y = x$?

flatter

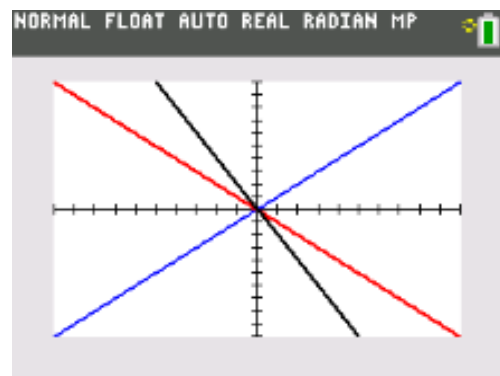


3. $y_1 = x$ $m=1$
 $y_2 = -x$ $m=-1$
 $y_3 = -2x$ $m=-2$

How is the slope (m) changing? negative

How does each graph compare to the linear parent function, $y = x$?

flipped over y-axis



4. $y_1 = 3x$
 $y_2 = -\frac{1}{3}x$

How does the graph of the linear function y_2 compare to the graph of the linear function y_1 ?

less steep, reflected

Perpendicular Lines:

have opposite reciprocal slopes

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

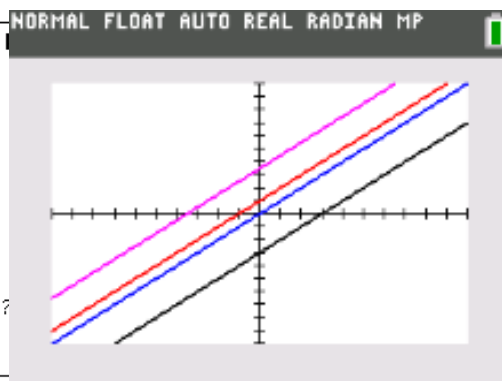
Sketch a graph of the following equations on the same coordinate

$y_1 = x$

$y_2 = x + 1$

5. $y_3 = x - 3$

$y_4 = x + 3\frac{1}{2}$

How is the slope changing? it's not!How does each graph compare to the linear parent function, $y = x$?moved up or downWhat is the relationship between all of the lines? parallel ☺Use this equation for problems 6-9: $y = 2x - 3$ 6. How does this compare to the linear parent function ($y = x$)?- moved down 3- steeper


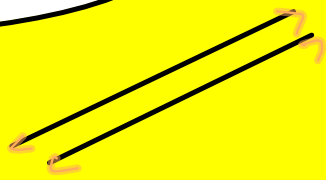
7. How would the graph change if the 2 in the equation from problem 6 was changed to a 5?



- even steeper

$y = 5x - 3$

8. What if the 2 was changed to a $\frac{1}{2}$? $y = \frac{1}{2}x - 3$; flatter9. What if the -3 was changed to a 6? $y = 2x + 6$; moved up 9.10. Predict what would happen if the slope of the function $f(x) = 2x - 3$ was changed to $-\frac{1}{2}$.perpendicular, flatter & flipped11. What is the relationship between these two lines? ↗**Summary:**Slope affects steepnessy-Intercept affects moved up/downLines that have the same slope are parallelPerpendicular lines slopes are flippin opposites and their product is -1

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definition	characteristics
two lines that never intersect	<u>SAME</u> slope
<div style="text-align: center;">  <h2 style="margin: 0;">Parallel</h2> </div>	
Beltline & Arapaho Rd. $y = 3x - 1$ $y = 3x + 7$	
examples	picture or memory tool

definition	characteristics
two lines that intersect at right angles	slopes are flippin' opposites (Flip over, change sign)
<div style="text-align: center;">  <h2 style="margin: 0;">Perpendicular</h2> </div>	
Beltline & Coit $m = \frac{1}{2}$ $\perp m = -\frac{2}{1}$	
examples	picture or memory tool

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Changing Slope:

Affects steepness

smaller slope
flatter

bigger slope
steeper

negative - reflects (flips)

Changing y-intercept:

Translates
(moves or
shifts)

graph
UP or DOWN

Pass Back Papers

Quiz Averages

2nd 73

3rd 62

4th 60

5th 67

7th 59

****Only way to raise quiz
grade is to do better on
Monday's test****

Test Corrections

* Must do at least 2 of the following

- Complete and turn in all assigned homework questions
- Have an up-to-date notebook
- Reworked quiz(zes) from the unit (figured out correct answers and errors made)
- Attended at least one tutoring session prior to the test (NOT 5 minutes and then leave)
- Asked questions in class or during tutoring about HW problems
- Participate actively in class discussions, lectures, and activities.

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

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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?

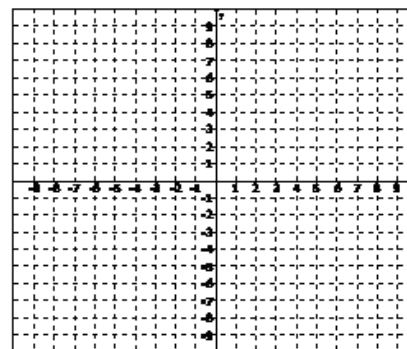
- a. $y = x + 2$
- b. $y = x - 2$
- c. $y = 2x$
- d. $y = \frac{1}{2}x$

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 .

