

MORE WORK GRAPHING LINEAR FUNCTIONS (LINES)

N-GEN MATH[®] ALGEBRA I



The graphs of **linear functions** depend on their **slope** and their **y-intercept**. It is critical that you understand how these two **parameters** affect the line's graph. Try the first exercise as a warm-up.

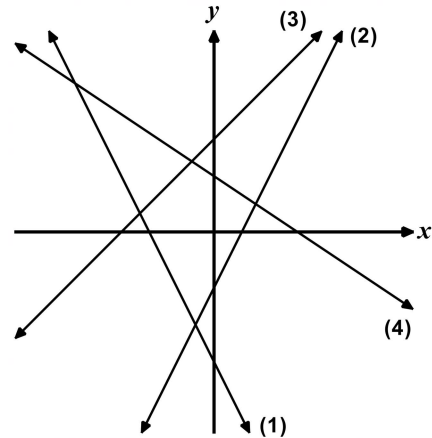
Exercise #1: Four linear functions are graphed on the set of axes below. Write the number of the line beside each equation based on its slope and y-intercept.

(a) $y = -\frac{2}{3}x + 3$ _____

(b) $y = x + 5$ _____

(c) $y = -2x - 7$ _____

(d) $y = 2x - 3$ _____

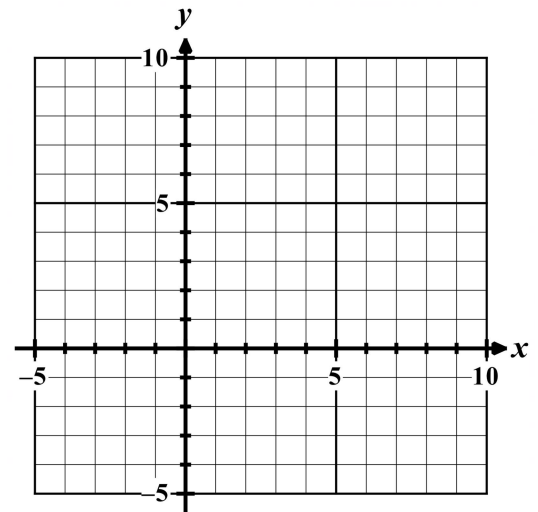


Recall that if a line is written in the form $y = mx + b$, then it is relatively easy to graph, especially if m and b are reasonably easy to work with. A quick review from the previous lesson.

Exercise #2: On the grid below, graph the equation $y = \frac{3}{2}x + 4$. First, identify its slope and y-intercept and then graph the line on the grid provided.

Slope: _____

y-intercept: _____



Exercise #3: Pick two sets of two coordinate points that lie on the line and find the average rate of change between the two points. What are both equal to?

(a) First set of two points:

(b) Second set of two points:



Sometimes linear equations are not written in a form that makes it easy to determine the slope and the y -intercept. It is important to be able to rearrange these formulas in order to quickly identify these linear parameters.

Exercise #4: Consider the linear equation given by $2y - 6x = 12$.

(a) Steps are shown below that rearrange this equation. Justify each step with a property of equality or a property of numbers.

(1) $2y - 6x + 6x = 12 + 6x$

(2) $2y = 6x + 12$

(3) $\frac{2y}{2} = \frac{6x + 12}{2}$

(4) $y = \frac{6x}{2} + \frac{12}{2}$

$$y = 3x + 6$$

(b) Identify the slope and the y -intercept of this line:

Exercise #5: Rearrange each of the following linear equations into $y = mx + b$ form and identify the slope and the y -intercept.

(a) $3y - 3x = 15$

(b) $2y + 5x = -8$

(c) $x - 3y = 6$

(d) $6x - 4y = -20$



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FLUENCY

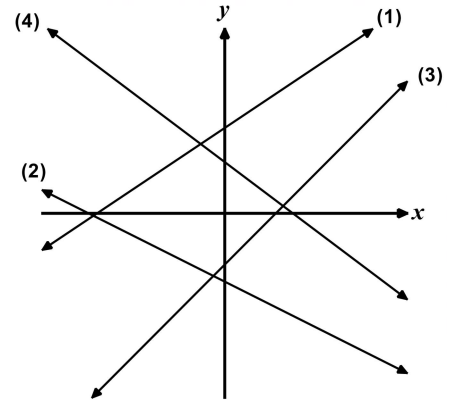
1. Four linear functions are shown graphed. Place the number of each line next to the equation that most appropriately models it.

(a) $y = \frac{2}{3}x + 5$ _____

(b) $y = x - 3$ _____

(c) $y = -\frac{3}{4}x + 3$ _____

(d) $y = -\frac{1}{2}x - 4$ _____



2. If the average rate of change between two points on the line $y = 4x + 7$ was calculated, which of the following would be its value?

(1) $\frac{4}{7}$ (3) 7

(2) $\frac{7}{4}$ (4) 4 _____

3. Which of the following is true about the linear function $2y + x = 18$?

(1) It has a slope of 2 and a y -intercept of 18.(2) It has a slope of -2 and a y -intercept of 9.(3) It has a slope of $-\frac{1}{2}$ and a y -intercept of 9.(4) It has a slope of $\frac{1}{2}$ and a y -intercept of 18. _____

4. Given the line whose equation is $2y - 6x = 10$, for every one unit of increase in x , which of the following is true about y ? (Hint, rearrange into $y = mx + b$ form first.)

(1) y decreases by 6(2) y increases by 3(3) y increases by 2(4) y decreases by 10 _____

5. Rewrite each of the following linear functions in $y = mx + b$ (slope-intercept) form. Identify the slope and the y -intercept and then graph on the grid given. Label each line with its original equation.

(a) $2y - 3x = 10$

Slope: _____ y -intercept: _____

(b) $x + 2y = 6$

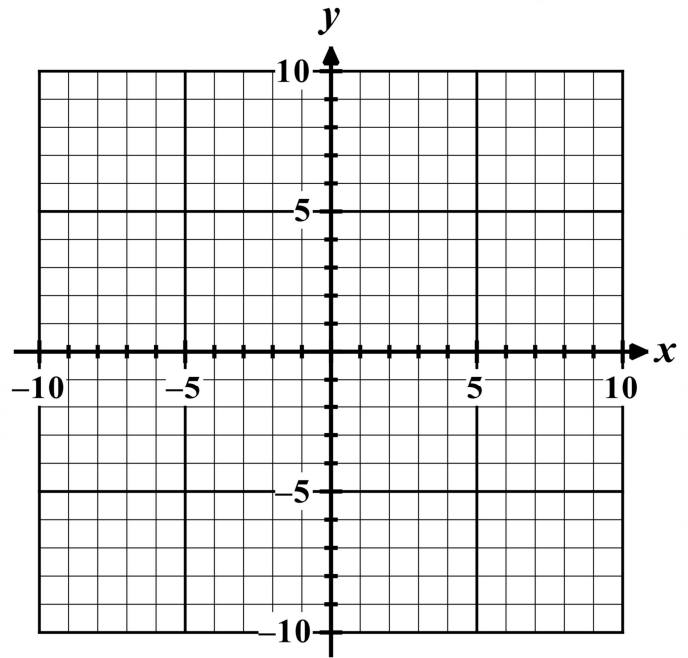
Slope: _____ y -intercept: _____

(c) $3y + 12 = 5x$

Slope: _____ y -intercept: _____

(d) $3x + 4y = -4$

Slope: _____ y -intercept: _____



REASONING

6. The two lines $y = ax + b$ and $y = cx + d$ are shown graphed. The values of $a, b, c,$ and d are not given, but properties of them can be inferred from the graph. Circle the pair of values below that **could** be equal.

b and d

a and d

a and c

Explain:

