

FLUENCY

1. For the linear function $g(x) = 7x - 2$, which of the following is true?

- ~~(1) It has a slope of 7 and a y-intercept of -2.~~
- ~~(2) It has a slope of -2 and a y-intercept of 7.~~
- ~~(3) It has a slope of 7x and a y-intercept of -2.~~
- (4) It has a slope of -2 and a y-intercept of 7x.

$$\frac{f(b) - f(a)}{b - a}$$

2. Which of the following represents the average rate of change of the function $g(x) = \frac{3}{2}x + 1$ over the interval $-2 \leq x \leq 8$?

- (1) $\frac{9}{7}$
- (2) $\frac{5}{4}$

$\frac{15}{10}$

~~(3) $\frac{3}{2}$~~

(4) $\frac{3}{2}$

$$\frac{\frac{3}{2}(8) + 1 - [\frac{3}{2}(-2) + 1]}{8 - (-2)}$$

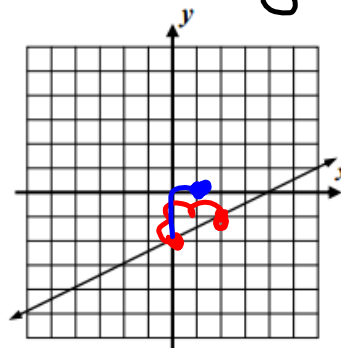
$$\frac{13 + 1}{8 + 2}$$

3. What is the equation of the line shown in the graph below?

- ~~(1) $y = 2x + 4$~~
- (2) $y = 2x - 2$

~~(3) $y = \frac{1}{2}x - 2$~~

~~(4) $y = \frac{1}{2}x + 4$~~



4. Which of the following is the equation of a line whose slope is 3 and which passes through the point (2, 7)?

(1) $y = 3x + 7$

(3) $y = 3x + 1$

(2) $y = 7x + 3$

(4) $y = 7x - 7$

$$y - y_1 = m(x - x_1)$$

$$y - 7 = 3(x - 2)$$

$$y - 7 = 3x - 6 + 7$$

5. Which of the following is the equation of a line that passes through the points (0, 8) and (6, 4)? Use of grid is optional.

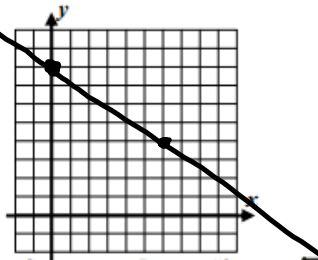
(1) $y = -\frac{2}{3}x + 8$

(3) $y = \frac{4}{5}x + 4$

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

(4) $y = \frac{1}{2}x + 8$

$y = 3x + 1$



6. Graph each of the following linear functions on the grid provided and label with their equations. For each, create a table **without** the use of your calculator to maintain **fluency** with operation facts. Show your table. In the first problem, the x -values are given. In others, you will have to choose them. Always include $x = 0$.

(a) $f(x) = 2x + 3$

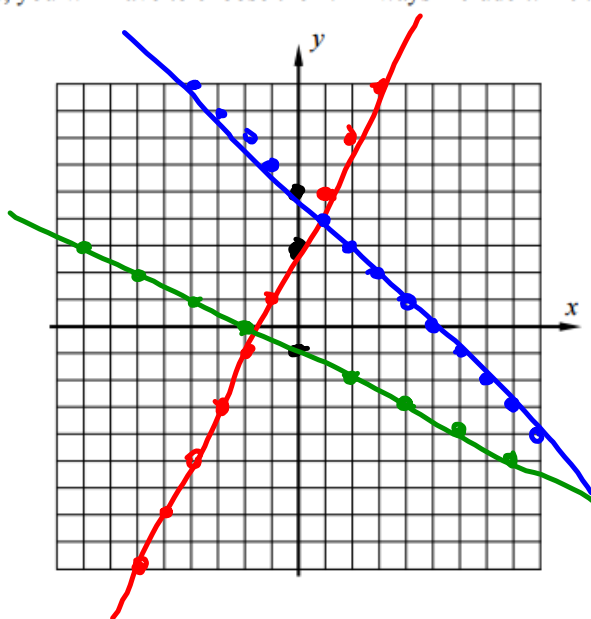
| | | | | | |
|--------|----|----|---|---|----|
| x | -5 | -2 | 0 | 2 | 5 |
| $f(x)$ | -7 | -1 | 3 | 7 | 13 |

(b) $g(x) = -\frac{1}{2}x - 1$

| | | | | | |
|--------|---------------|----|----|----|----------------|
| x | -3 | -2 | 0 | 2 | 3 |
| $g(x)$ | $\frac{1}{2}$ | 0 | -1 | -2 | $-\frac{5}{2}$ |

(c) $h(x) = 5 - x$

| | | | | | |
|--------|----|----|---|---|---|
| x | -3 | -2 | 0 | 2 | 3 |
| $h(x)$ | 8 | 7 | 5 | 3 | 2 |



7. State the values of the slope and the y -intercept for each of the following linear functions. Then, use this information to create graphs of the functions on the grid below. Label each with its equation.

~~(a)~~ (a) $y = \frac{2}{3}x - 4$
 Slope: $\frac{2}{3}$

y -intercept: -4

(b) $y = -\frac{5}{2}x + 7$
 Slope: $-\frac{5}{2}$

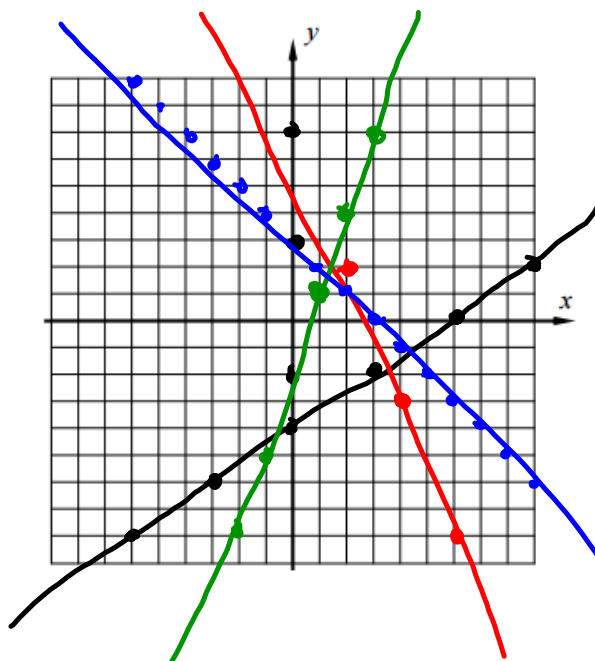
y -intercept: 7

(c) $y = 3x - 2$
 Slope: 3

y -intercept: -2

(d) $y = -x + 3$
 Slope: -1

y -intercept: 3



Mindfulness:

Choose Your Breath:

Initial (monitor/keep rhythm)

Heart/Belly

Calming (2 in, 4 out)

Energizing (4 in, 2 out)

Bell Ringer:

$$\frac{f(b) - f(a)}{b - a}$$

An astronaut drops a rock off the edge of a cliff on the Moon. The distance, $d(t)$, in meters, the rock travels after t seconds can be modeled by the function $d(t) = 0.8t^2$. What is the average speed, in meters per second, of the rock between 5 and 10 seconds after it was dropped?

$$b = 5$$

$$a = 10$$

- 1) 12
- 2) 20
- 3) 60
- 4) 80

$$\frac{0.8(5)^2 - 0.8(10)^2}{5 - 10} = \frac{20 - 80}{-5} = \frac{-60}{-5} = 12$$

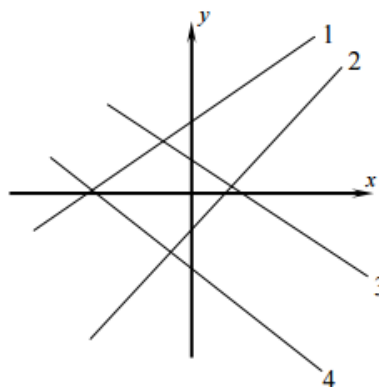
MORE WORK GRAPHING LINEAR FUNCTIONS (LINES)
COMMON CORE ALGEBRA I



It is critical that you are able to graph lines and understand graphs of lines. Try the first exercise as a warm up.

Exercise #1: Four lines are graphed on the set of axes below. Write the number of the line beside each of the correct equations.

| EQUATION | |
|-------------------------|---|
| $y = -\frac{2}{3}x + 3$ | 3 |
| $y = x + 5$ | 1 |
| $y = -2x - 7$ | 4 |
| $y = 2x - 3$ | 2 |

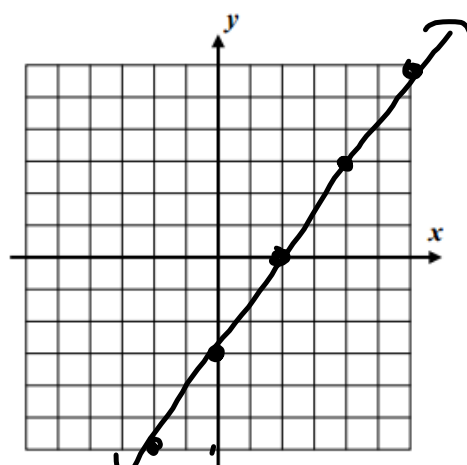


Recall that if a line is written in the form $y = mx + b$, then it is relatively easy to graph, especially if m and b are reasonably easy to work with. A quick review from the previous lesson.

Exercise #2: On the grid below, graph the equation $y = \frac{3}{2}x - 3$. First, identify its slope and y-intercept to help you with the graph.

Slope: _____

y-intercept: _____



Exercise #3: Write down two points this line passes through and use them to calculate the average rate of change of this function.

$$x_2(4, 3) y_2$$

$$x_1(2, 0) y_1$$

$$\frac{3-0}{4-2} = \frac{3}{2}$$

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.

$$(1) 2y - \cancel{6x + 6x} = 12 + 6x$$

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

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

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

$$y = 3x + 6$$

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

$$m = 3$$

$$b = 6$$

ADD. PROP. EQUALITY
ADD. INVERSE / COMM. PROP.
MULT. PROP. EQUALITY
DIST. PROP. OF DIVISION
OVER ADDITION

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

(a) $3y - 3x = 15 + 3x$ $\left(\begin{array}{l} m=1 \\ b=5 \end{array} \right)$

$$\frac{3y = 3x + 15 + 3x}{3}$$

$$y = x + 5$$

(c) $x - 3y = 6$

$$\frac{-3y = -x + 6}{-3}$$

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

$$m = \frac{1}{3}, b = -2$$

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

$$\frac{2y = -5x - 8}{2} \quad m = -\frac{5}{2}$$

$$y = -\frac{5}{2}x - 4 \quad b = -4$$

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

$$\frac{-4y = -6x - 20}{-4}$$

$$y = \frac{3}{2}x + 5$$

$$m = \frac{3}{2}, b = 5$$