



# Algebra 1 Readiness Intervention Lessons

**Readiness Standard 3 - 8.F.4**

**Learning Target:** I will find the equation of a line

**Readiness for F.IF.7:** Graph functions expressed symbolically

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## IES Recommendations for Improving Algebra Knowledge:

<b>Recommendation</b>
1. Use solved problems to engage students in analyzing algebraic reasoning and strategies.
2. Teach students to utilize the structure of algebraic representations.
3. Teach students to intentionally choose from alternative algebraic strategies when solving problems.

(Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students, 2015, p. 3)



# High School Planning Guide

Algebra 1 - Readiness Standard 3 - 8.F.4

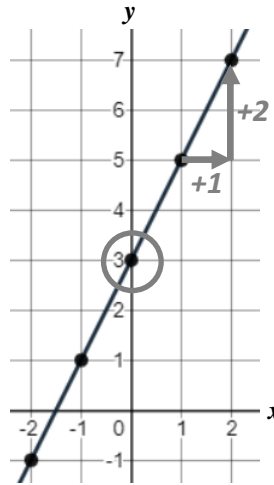
Recommended Actions ≈ 30 minutes	
<b>Beginning</b> (5 min.)	<ul style="list-style-type: none"><li>➤ <b>Review</b> the learning target with the whole group.</li><li>➤ For sessions 3 and 4, ask each student to <b>set a personal goal</b> for the day based on their previous Quick Check Score and use a highlighter to plot their goal on their Growth Chart.</li></ul>
<b>Middle</b> (15 min.)	<ul style="list-style-type: none"><li>➤ <b>Guided Practice</b><ul style="list-style-type: none"><li>○ <b>Whole Group (Analyze solved problems)</b><ul style="list-style-type: none"><li>▪ The teacher covers up all solution steps except the first two.</li><li>▪ The teacher asks, “What math happened?” and elicits student responses to fill in the missing information.</li><li>▪ The teacher answers student questions to clarify the solution step.</li><li>▪ The teacher uncovers the next answer blank and repeats the analysis.</li></ul></li><li>○ <b>Pairs (Gradual release to solve problems)</b><ul style="list-style-type: none"><li>▪ Students take turns leading to “think aloud” while completing each problem.</li></ul></li></ul></li></ul>
<b>End</b> (10 min.)	<ul style="list-style-type: none"><li>➤ <b>Reflect, Assess and Monitor Progress</b><ul style="list-style-type: none"><li>○ Ask students to <b>reflect</b> on their progress towards the learning target.<ul style="list-style-type: none"><li>▪ What did I learn today about the learning target?</li><li>▪ How confident do I feel about doing the learning target on my own?</li></ul></li><li>○ <b>Assess</b> each student’s progress using a Quick Check.</li><li>○ Guide students to <b>self-correct</b> their Quick Check.</li><li>○ Guide students to <b>chart their progress</b> in their Growth Chart.<ul style="list-style-type: none"><li>▪ If not using Delta Math lessons, record the activity in the table.</li></ul></li><li>○ Collect each student’s Quick Check and Growth Chart.</li></ul></li></ul>
<b>After</b>	<ul style="list-style-type: none"><li>➤ <b>Exit</b> students who meet or exceed the learning goal for a third time.</li></ul>

**Learning Target:** I will find the equation of a line  
**Readiness** for graphing functions expressed symbolically

Algebra 1 – Readiness Standard 3 – 8.F.4

## Session 1: Guided Practice (Whole Group)

	$x$	$y$
	-2	-1
+1	-1	1
+1	0	3
+1	1	5
+1	2	7



$$\text{Slope} = \frac{2}{1} = 2$$

$$\text{y-intercept} = 3$$

$$\text{Equation of Line: } y = 2x + 3$$

**Directions:** A line is represented above in a table, graph and equation. Complete the statements below.

- The **slope** represents the *steepness* of a line and is  $\frac{\text{the change in } y \text{ values}}{\text{the change in } x \text{ values}}$  between two points on the line.
  - In the table, each  $x$ -value increases by \_\_\_\_\_ and each  $y$ -value increases by \_\_\_\_\_.
  - In the graph, the arrows show the  $x$ -values increasing by \_\_\_\_\_ and the  $y$ -values increasing by \_\_\_\_\_.
  - The **slope** of the line is \_\_\_\_\_ = \_\_\_\_\_.
- The **y-intercept** of a line is the  $y$ -value of the point where the line crosses the  $y$ -axis and the  $x$ -value is 0.
  - In the graph, (\_\_\_\_\_, \_\_\_\_\_) is the coordinate of the point where the line crosses the  $y$ -axis.
  - In the table, the point where the line crosses the  $y$ -axis is when the  $x$ -value is \_\_\_\_\_.
  - The **y-intercept** of the line is \_\_\_\_\_.
- The equation of a line relates **slope**, **y-intercept** and the coordinates of each point on the line ( $x, y$ ). And is written as:  $y = \text{slope} \cdot x + \text{y-intercept}$ . Therefore, the equation of the line above is

$$y = \underline{\hspace{2cm}} x + \underline{\hspace{2cm}}$$



Name \_\_\_\_\_

Date \_\_\_\_\_

**Learning Target:** I will determine the number of solutions to linear equations in one variable

Algebra 1 – Readiness Standard 2 – 8.EE.7a

**Readiness** for solving systems of linear equations

## Session 1: Number of Solutions (Pairs)

**Directions:** Match the description, table and graph representing the same linear equation.

Example:

**Described as words**

$$y = 3x + 2$$

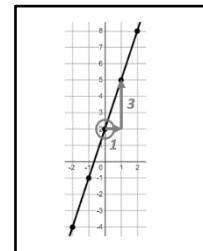
When  $x = 0$ ,  $y = 2$   
(*y*-intercept)

When an  $x$ -value increases by 1,  
the  $y$ -value increases by 3  
(*Slope*)

**Table**

	$x$	$y$	
+1	-2	-4	+3
+1	-1	-1	+3
+1	0	2	+3
+1	1	5	+3
+1	2	8	+3

**Graph**



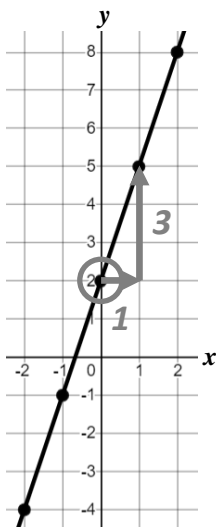
# Session 1: Card Sort (Set 1)

$$y = 3x + 2$$

When  $x = 0$ ,  $y = 2$   
(*y*-intercept)

When an  $x$ -value **increases by 1**,  
the  $y$ -value **increases by 3**  
(*Slope*)

	$x$	$y$	
+1	-2	-4	+3
+1	-1	-1	+3
+1	0	2	+3
+1	1	5	+3
+1	2	8	+3

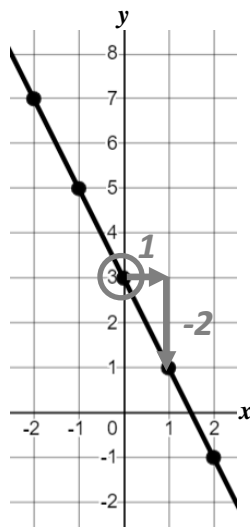


$$y = -2x + 3$$

When  $x = 0$ ,  $y = 3$   
(*y*-intercept)

When an  $x$ -value **increases by 1**,  
the  $y$ -value **decreases by 2**  
(*Slope*)

	$x$	$y$	
+1	-2	7	-2
+1	-1	5	-2
+1	0	3	-2
+1	1	1	-2
+1	2	-1	-2

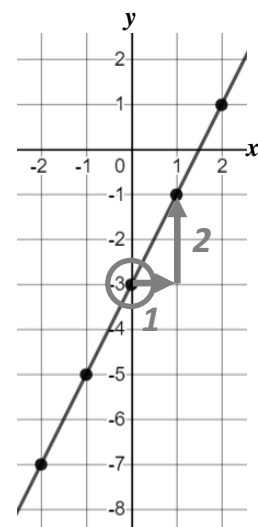


$$y = 2x - 3$$

When  $x = 0$ ,  $y = -3$   
(*y*-intercept)

When an  $x$ -value **increases by 1**,  
the  $y$ -value **increases by 2**  
(*Slope*)

	$x$	$y$	
+1	-2	-7	2
+1	-1	-5	2
+1	0	-3	2
+1	1	-1	2
+1	2	1	2



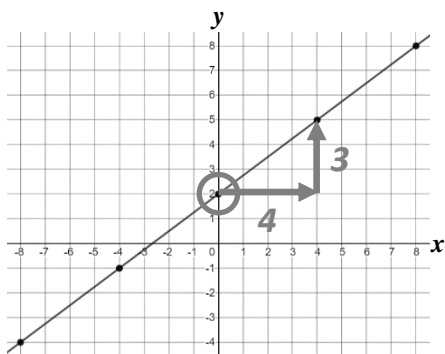
# Session 1: Card Sort (Set 2)

$$y = \frac{3}{4}x + 2$$

When  $x = 0$ ,  $y = 2$   
(*y*-intercept)

When an  $x$ -value **increases by 4**,  
the  $y$ -value **increases by 3**  
(*Slope*)

	$x$	$y$	
	-8	-4	
+4 <	-4	-1	> +3
+4 <	0	2	> +3
+4 <	4	5	> +3
+4 <	8	8	> +3

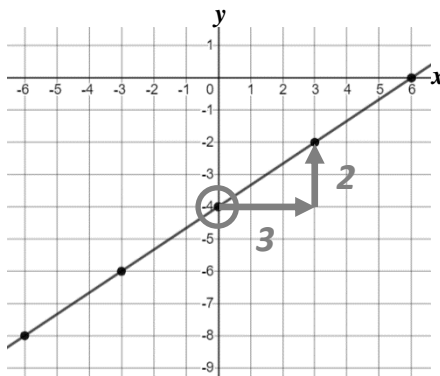


$$y = \frac{2}{3}x + -4$$

When  $x = 0$ ,  $y = -4$   
(*y*-intercept)

When an  $x$ -value **increases by 3**,  
the  $y$ -value **increases by 2**  
(*Slope*)

	$x$	$y$	
	-6	-8	
+3 <	-3	-6	> +2
+3 <	0	-4	> +2
+3 <	3	-2	> +2
+3 <	6	0	> +2

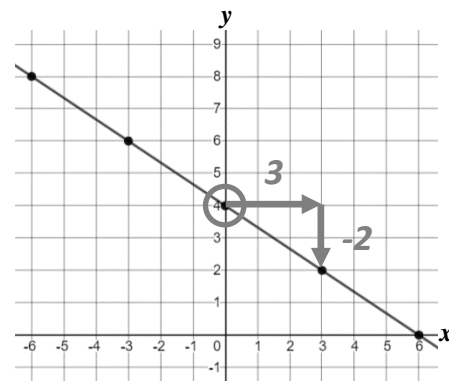


$$y = -\frac{2}{3}x + 4$$

When  $x = 0$ ,  $y = 4$   
(*y*-intercept)

When an  $x$ -value **increases by 2**,  
the  $y$ -value **decreases by 3**  
(*Slope*)

	$x$	$y$	
	-6	8	
+3 <	-3	6	> -2
+3 <	0	4	> -2
+3 <	3	2	> -2
+3 <	6	0	> -2

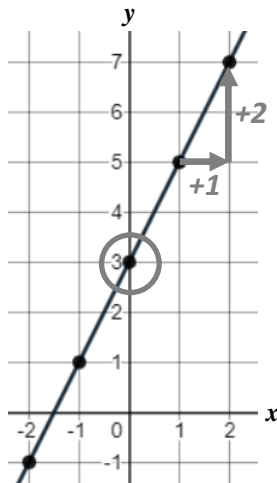


**Learning Target:** I will find the equation of a line  
**Readiness** for graphing functions expressed symbolically

Algebra 1 – Readiness Standard 3 – 8.F.4

## Session 1: Guided Practice (Teacher Notes)

	$x$	$y$
	-2	-1
+1	-1	1
+1	0	3
+1	1	5
+1	2	7



$$\text{Slope} = \frac{2}{1} = 2$$

$$\text{y-intercept} = 3$$

$$\text{Equation of Line: } y = 2x + 3$$

**Directions:** A line is represented above in a table, graph and equation. Complete the statements below.

- The **slope** represents the *steepness* of a line and is  $\frac{\text{the change in } y \text{ values}}{\text{the change in } x \text{ values}}$  between two points on the line.
  - In the table, each  $x$ -value increases by 1 and each  $y$ -value increases by 2.
  - In the graph, the arrows show the  $x$ -values increasing by 1 and the  $y$ -values increasing by 1.
  - The **slope** of the line is  $\frac{2}{1} = \underline{2}$ .
- The **y-intercept** of a line is the  $y$ -value of the point where the line crosses the  $y$ -axis and the  $x$ -value is 0.
  - In the graph, (0, 3) is the coordinate of the point where the line crosses the  $y$ -axis.
  - In the table, the point where the line crosses the  $y$ -axis is when the  $x$ -value is 0.
  - The **y-intercept** of the line is 3.
- The equation of a line relates **slope**, **y-intercept** and the coordinates of each point on the line ( $x$ ,  $y$ ). And is written as:  $y = \text{slope} \cdot x + \text{y-intercept}$ . Therefore, the equation of the line above is

$$y = \underline{2}x + \underline{3}$$





# Session 1: Self-Reflection

Algebra 1 – Readiness Standard 3 – 8.F.4

**Learning Target:** I will find the equation of a line

Briefly discuss student responses

- What did I learn today about finding the equation of a line?
  
- How confident do I feel about finding an equation of a line on my own?  
*(Thumbs up, down, or sideways)*

**No Quick Check Today!**



**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 2: Guided Practice (Whole Group)

1. Below are the algebraic steps to find the equation of the line through the points (-1, 2) and (2, 11). For each solution step, discuss what happened and fill in the missing information.

Calculate the slope of the line given two points

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 2}{2 - -1} = \frac{9}{3} = 3$$

↑ Slope Formula      ↑ Substituted coordinates  
 (x<sub>1</sub>, y<sub>1</sub>) = (\_\_\_\_, \_\_\_\_)  
 (x<sub>2</sub>, y<sub>2</sub>) = (\_\_\_\_, \_\_\_\_)  
 ↑ Added to Subtract  
 2 + \_\_\_\_ = 3  
 ↑ Simplified  
 \_\_\_\_ ÷ \_\_\_\_ = 3

Find the value of the y-intercept

$$y = m \cdot x + b$$

**Slope-Intercept Equation**  
slope = \_\_\_\_, y-intercept = \_\_\_\_

$$11 = 3 \cdot 2 + b$$

**Substituted Known Values**  
x<sub>2</sub> = \_\_\_\_, y<sub>2</sub> = \_\_\_\_,  
and m = \_\_\_\_

$$11 = 6 + b$$

**Multiplied to Simplify**  
\_\_\_\_ • \_\_\_\_ = 6

$$\underline{-6} \quad \underline{-6}$$

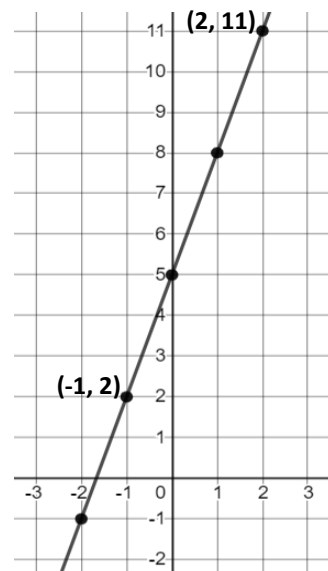
$$5 = b$$

**Added to find b**  
\_\_\_\_ + \_\_\_\_ = 5  
\_\_\_\_ + \_\_\_\_ = 0

**Conclusion:** The slope of the line is \_\_\_\_ and the y-intercept is \_\_\_\_\_. Therefore, the equation of the line extending through points the (-1, 2) and (2, 11) is  $y = \underline{\quad}x + \underline{\quad}$ .

2. Verify the algebraic solution above by finding the value of the slope and y-intercept in the table and graph.

x	y
-2	-1
-1	2
0	5
1	8
2	11





**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 2: Guided Practice (Pairs)

3. Complete the algebraic steps to find the equation of the line through the points (-6, 3) and (6, 7). Then check your work by finding the slope and y-intercept in the graph.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{6 - -6} = \underline{\quad} = \underline{\quad}$$

$$y = mx + b$$

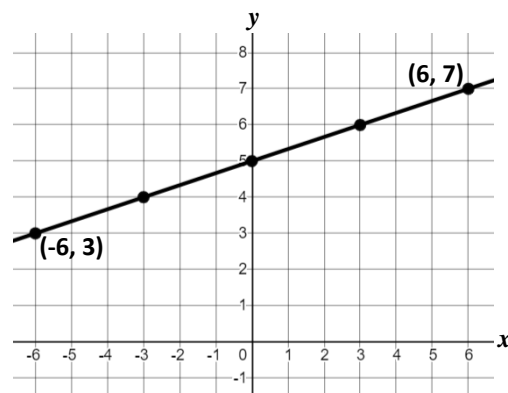
$$7 = \frac{1}{3} \cdot 6 + b$$

$$\underline{\quad} = \underline{\quad} + b$$

$$\underline{-2} \quad \underline{-2}$$

$$\underline{\quad} = b$$

$$y = \boxed{\quad} x + \boxed{\quad}$$



4. Complete the algebraic steps to find the equation of the line through the points (-1, -8) and (2, 7). Then check your work by finding the slope and y-intercept in the table.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - \quad}{2 - \quad} = \frac{\quad}{3} = \frac{5}{\quad}$$

$$y = mx + b$$

$$\underline{\quad} = \underline{\quad} \cdot 2 + b$$

$$\underline{\quad} = \underline{\quad} + b$$

$$\underline{-10} \quad \underline{-10}$$

$$\underline{\quad} = b$$

$$y = \boxed{\quad} x + \boxed{\quad}$$

x	y
-2	-13
-1	-8
0	-3
1	2
2	7

**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 2: Guided Practice (Teacher Notes)

1. Below are the algebraic steps to find the equation of the line through the points  $(-1, 2)$  and  $(2, 11)$ . For each solution step, discuss what happened and fill in the missing information.

**Calculate the slope of the line given two points**

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 2}{2 - -1} = \frac{9}{3} = 3$$

↑ Slope Formula      ↑ Substituted coordinates  
 $(x_1, y_1) = (-1, 2)$   
 $(x_2, y_2) = (2, 11)$   
 ↑ Added to Subtract  
 $2 + +1 = 3$   
 ↑ Simplified  
 $9 \div 3 = 3$

**Find the value of the y-intercept**

$$y = m x + b$$

**Slope-Intercept Equation**  
slope = m, y-intercept = b

$$11 = 3 \cdot 2 + b$$

**Substituted Known Values**  
 $x_2 = 2, y_2 = 11,$   
and  $m = 3$

$$11 = 6 + b$$

**Multiplied to Simplify**  
 $3 \cdot 2 = 6$

$$\underline{-6} \quad \underline{-6}$$

$$5 = b$$

**Added to find b**  
 $11 + -6 = 5$   
 $6 + -6 = 0$

**Conclusion:** The slope of the line is 3 and the y-intercept is 5. Therefore, the equation of the line extending through points the  $(-1, 2)$  and  $(2, 11)$  is  $y = 3x + 5$ .

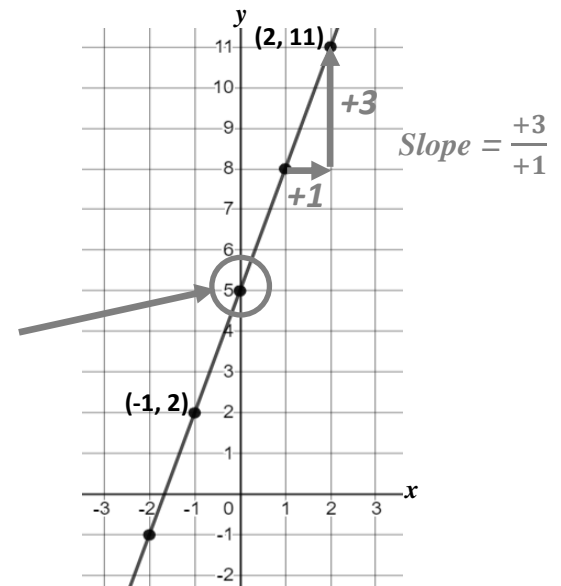
2. Verify the algebraic solution above by finding the value of the slope and y-intercept in the table and graph.

**Remember:**  
When  $x = 0$ , the line is crossing the y-axis

$x$	$y$
-2	-1
-1	2
0	5
1	8
2	11

$2 - 1 = 1$        $11 - 8 = 3$   
 $\frac{11 - 8}{2 - 1} = \frac{3}{1}$   
**Slope =  $\frac{3}{1}$**

y-intercept



**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 2: Guided Practice (Teacher Notes - Cont.)

3. Complete the algebraic steps to find the equation of the line through the points  $(-6, 3)$  and  $(6, 7)$ . Then check your work by finding the slope and y-intercept in the graph.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{6 - -6} = \frac{4}{12} = \frac{1}{3}$$

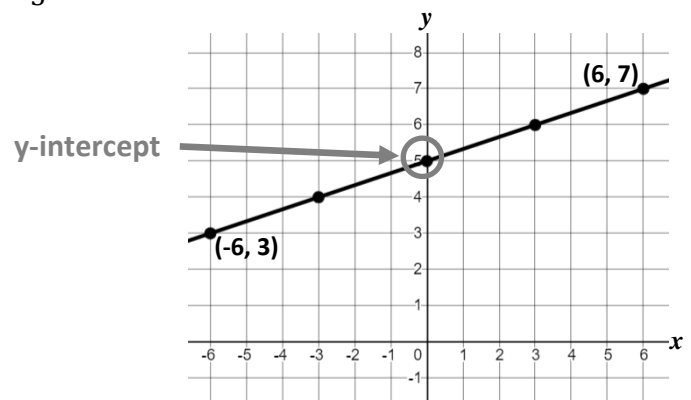
$$y = mx + b$$

$$7 = \frac{1}{3} \cdot 6 + b$$

$$\begin{array}{r} 7 = 2 + b \\ \underline{-2 \quad -2} \end{array}$$

$$5 = b$$

$$y = \boxed{\frac{1}{3}}x + \boxed{5}$$



4. Complete the algebraic steps to find the equation of the line through the points  $(-1, -8)$  and  $(2, 7)$ . Then check your work by finding the slope and y-intercept in the table.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - -8}{2 - -1} = \frac{15}{3} = \frac{5}{1}$$

$$y = mx + b$$

$$7 = 5 \cdot 2 + b$$

$$\begin{array}{r} 7 = 10 + b \\ \underline{-10 \quad -10} \end{array}$$

$$-3 = b$$

$$y = \boxed{5}x + \boxed{-3}$$

x	y
-2	-13
-1	-8
0	-3
1	2
2	7

Annotations: An arrow points to the value -3 in the y-column, labeled "y-intercept". A curved arrow shows the change from x=1 to x=2 (delta x = 1) and from y=2 to y=7 (delta y = 5). Another curved arrow shows the change from x=-1 to x=2 (delta x = 3) and from y=-8 to y=7 (delta y = 15).

$$\text{Slope} = \frac{5}{1} = 5$$



## Session 2: Self-Reflection

Algebra 1 – Readiness Standard 3 – 8.F.4

**Learning Target:** I will find the equation of a line

Briefly discuss student responses

- What did I learn today about finding the equation of a line?
  
- How confident do I feel about finding an equation of a line on my own?

*(Thumbs up, down, or sideways)*



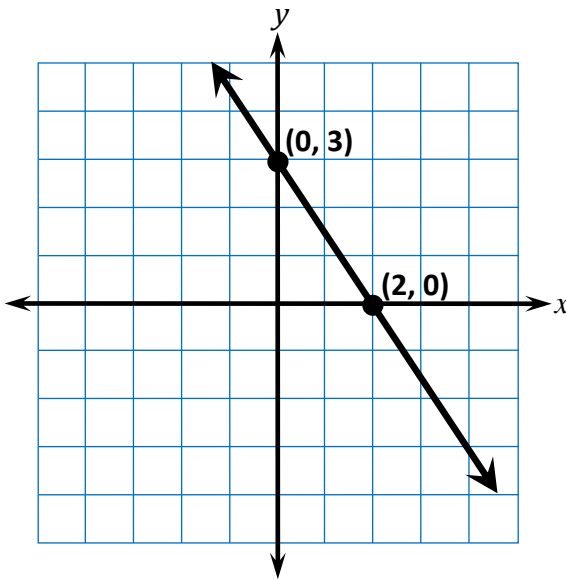
# Algebra 1 Quick Check – Form A

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
-1	6
0	4
1	2
2	0
3	-2

$$y = \square x + \square$$



# Algebra 1 Quick Check – Form A

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-2	-1
0	5
2	11
4	17
6	23

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-3, -2)$  and  $(4, 12)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(3, 9)$  and  $(15, 17)$

$$y = \square x + \square$$





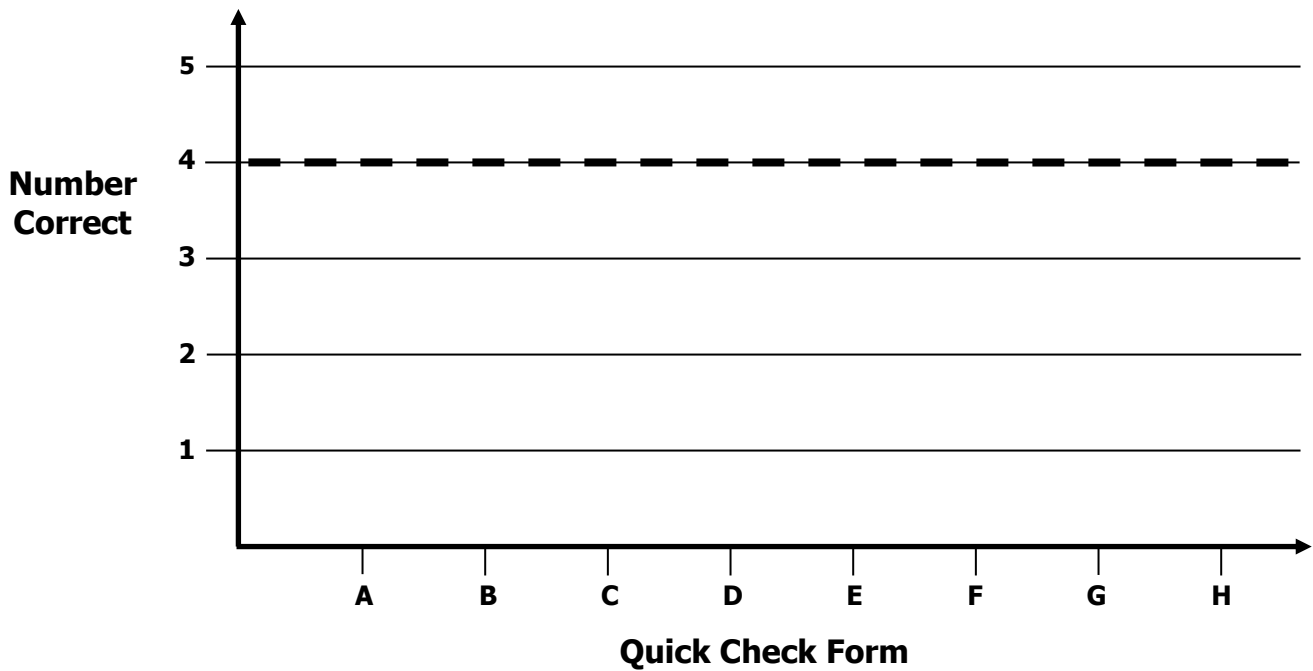
# Algebra 1 Growth Chart

Readiness Standard 2 - 8.EE.7a

Name \_\_\_\_\_

**Learning Target:** I will find the equation of a line.

**Goal:** 4 out of 5 correct



Intervention	Date	Score
Session 1		
Session 2		
Session 3		
Session 4		
Session 5		
Session 6		
Session 7		
Session 8		

**Learning Target:** I will find the equation of a line  
**Readiness** for graphing functions expressed symbolically

Algebra 1 – Readiness Standard 3 – 8.F.4

## Session 3: Guided Practice (Whole Group)

1. Below are the algebraic steps to find the equation of the line through the points (-6, 3) and (6, 11). For each solution step, discuss what happened and fill in the missing information.

**Calculate the slope of the line given two points**

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 3}{6 - -6} = \frac{8}{12} = \frac{2}{3}$$

↑ Slope Formula  
 ↑ Substituted coordinates  
 $(x_1, y_1) = (\underline{\quad}, \underline{\quad})$   
 $(x_2, y_2) = (\underline{\quad}, \underline{\quad})$   
 ↑ Added to Subtract  
 $6 + \underline{\quad} = 12$   
 ↑ Simplified  
 $\underline{\quad} \div \underline{\quad} = 2$   
 $\underline{\quad} \div \underline{\quad} = 3$

**Find the value of the y-intercept**

$$y = mx + b$$

**Slope-Intercept Equation**  
 slope = \_\_\_\_\_, y-intercept = \_\_\_\_\_

$$11 = \frac{2}{3} \cdot 6 + b$$

**Substituted Known Values**  
 $x_2 = \underline{\quad}, y_2 = \underline{\quad}$   
 and  $m = \underline{\quad}$

$$11 = 4 + b$$

**Multiplied to Simplify**  
 $\underline{\quad} \cdot \underline{\quad} = 4$

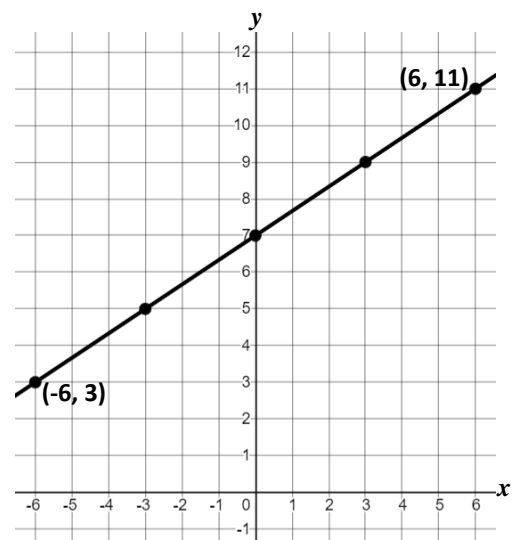
$$\underline{-4} \quad \underline{-4}$$

**Added to find "b"**  
 $\underline{\quad} + \underline{\quad} = 7$   
 and  
 $\underline{\quad} + \underline{\quad} = 0$

**Conclusion:** The slope of the line is \_\_\_\_\_ and the y-intercept is \_\_\_\_\_. Therefore, the equation of the line extending through points the (-6, 3) and (6, 11) is  $y = \underline{\quad}x + \underline{\quad}$ .

2. Verify the algebraic solution above by finding the value of the slope and y-intercept in the table and graph.

x	y
-6	3
-3	5
0	7
3	9
6	11





**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 3: Guided Practice (Pairs)

3. Complete the algebraic steps to find the equation of the line through the points (-8, -5) and (4, -2). Then check your work by finding the slope and y-intercept in the graph.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - \quad}{4 - \quad} = \quad = \quad$$

$$y = mx + b$$

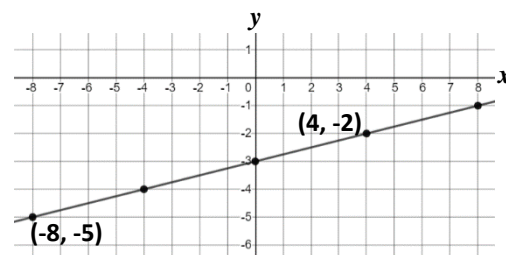
$$-2 = \frac{1}{4} \cdot \quad + b$$

$$-2 = \quad + b$$

$$\frac{-1}{\quad} = \frac{-1}{\quad}$$

$$\quad = b$$

$$y = \boxed{\quad} x + \boxed{\quad}$$



4. Complete the algebraic steps to find the equation of the line through the points (-2, 8) and (2, -4). Then check your work by finding the slope and y-intercept in the table.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

x	y
-2	8
-1	5
0	2
1	-1
2	-4

$$y = \boxed{\quad} x + \boxed{\quad}$$

**Learning Target:** I will find the equation of a line  
**Readiness** for graphing functions expressed symbolically

Algebra 1 – Readiness Standard 3 – 8.F.4

## Session 3: Guided Practice (Teacher Notes)

1. Below are the algebraic steps to find the equation of the line through the points  $(-6, 3)$  and  $(6, 11)$ . For each solution step, discuss what happened and fill in the missing information.

**Calculate the slope of the line given two points**

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 3}{6 - -6} = \frac{8}{12} = \frac{2}{3}$$

Wrote the Slope Formula  
 Substituted coordinates  
 $(x_1, y_1) = (-6, 3)$   
 $(x_2, y_2) = (6, 11)$   
 Added to Subtract  
 $6 + -6 = 12$   
 Simplified  
 $8 \div 4 = 2$   
 $12 \div 4 = 3$

**Find the value of the y-intercept**

$$y = mx + b$$

Wrote the Linear Equation  
 slope = m, y-intercept = b

$$11 = \frac{2}{3} \cdot 6 + b$$

Substituted Known Values  
 $x_2 = 6, y_2 = 11,$   
 and  $m = \frac{2}{3}$

$$11 = 4 + b$$

Multiplied to Simplify  
 $\frac{2}{3} \cdot 6 = 4$

$$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$$

$7 = b$

Added to find b  
 $11 + -4 = 7$   
 and  
 $4 + -4 = 0$

**Conclusion:** The slope of the line is  $\frac{2}{3}$  and the y-intercept is 7. Therefore, the equation of the line extending through points the  $(-6, 3)$  and  $(6, 11)$  is  $y = \frac{2}{3}x + 7$ .

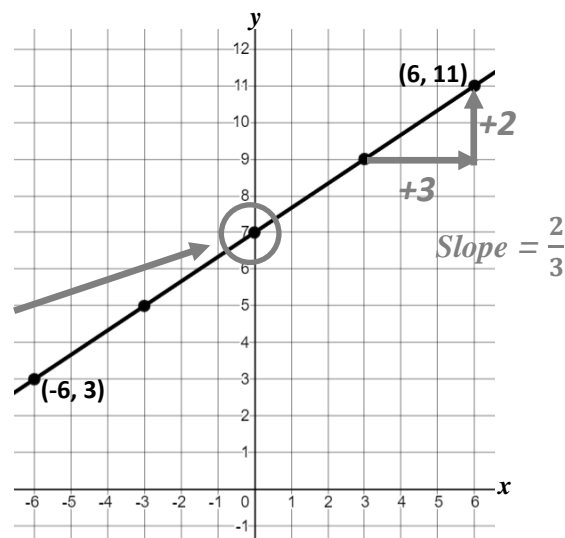
2. Verify the algebraic solution above by finding the value of the slope and y-intercept in the table and graph.

**Remember:**  
 When  $x = 0$ , the line is crossing the y-axis

	$x$	$y$
	-6	3
	-3	5
	0	7
	3	9
	6	11

$6 - 3 = 3$   
 $11 - 9 = 2$   
**Slope =  $\frac{2}{3}$**

$\leftarrow$  y-intercept



**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 3: Guided Practice (Teacher Notes - Cont.)

3. Complete the algebraic steps to find the equation of the line through the points  $(-8, -5)$  and  $(4, -2)$ . Then check your work by finding the slope and y-intercept in the graph.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - (-5)}{4 - (-8)} = \frac{3}{12} = \frac{1}{4}$$

$$y = mx + b$$

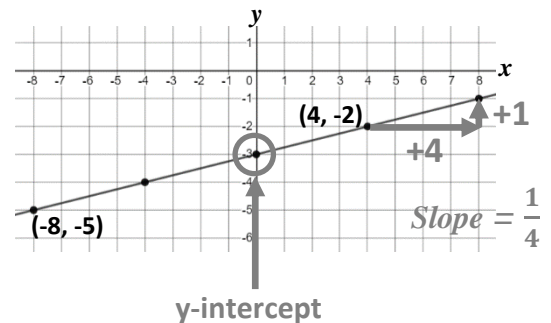
$$-2 = \frac{1}{4} \cdot 4 + b$$

$$-2 = 1 + b$$

$$\underline{-1 \quad -1}$$

$$-3 = b$$

$$y = \boxed{\frac{1}{4}}x + \boxed{-3}$$



4. Complete the algebraic steps to find the equation of the line through the points  $(-2, 8)$  and  $(2, -4)$ . Then check your work by finding the slope and y-intercept in the table.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - 8}{2 - (-2)} = \frac{-12}{4} = \frac{-3}{1}$$

$$y = mx + b$$

$$-4 = -3 \cdot 2 + b$$

$$-4 = -6 + b$$

$$\underline{+6 \quad +6}$$

$$2 = b$$

$$y = \boxed{-3}x + \boxed{2}$$

x	y
-2	8
-1	5
0	2
1	-1
2	-4

Annotations: The value 2 in the y-column is circled and labeled "y-intercept". A right triangle is drawn between the points (1, -1) and (2, -4) with a horizontal leg of length 1 (labeled "2-1") and a vertical leg of length 3 (labeled "-4-1"). The slope is labeled as -3/1.



## Session 3: Self-Reflection

Algebra 1 – Readiness Standard 3 – 8.F.4

**Learning Target:** I will find the equation of a line

Briefly discuss student responses

- What did I learn today about finding the equation of a line?
  
- How confident do I feel about finding an equation of a line on my own?

*(Thumbs up, down, or sideways)*



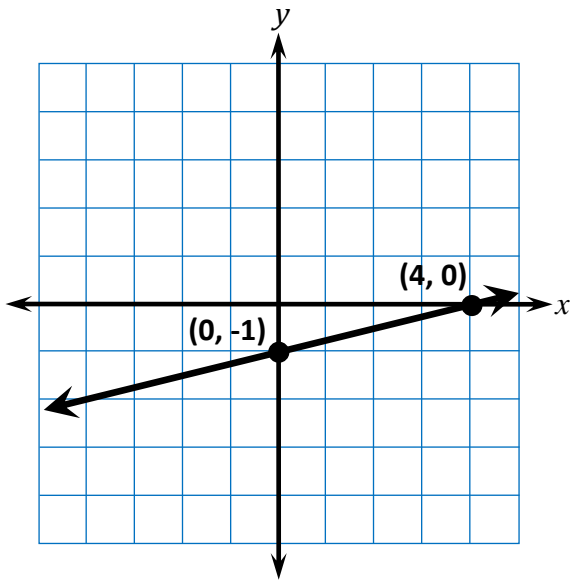
# Algebra 1 Quick Check – Form B

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
-3	0
-2	-3
-1	-6
0	-9
1	-12

$$y = \square x + \square$$



# Algebra 1 Quick Check – Form B

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-6	-28
-3	-13
0	2
3	17
6	32

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-3, -4)$  and  $(3, 14)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(5, 7)$  and  $(15, 13)$

$$y = \square x + \square$$



**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

# Session 4: Guided Practice (Whole Group)

1. Below are the algebraic steps to find the equation of the line through the points (-3, -5) and (6, -2). For each solution step, discuss what happened and fill in the missing information.

**Calculate the slope of the line given two points**

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - -5}{6 - -3} = \frac{3}{9} = \frac{1}{3}$$

**Slope Formula**      **Substituted coordinates**  
 $(x_1, y_1) = (\underline{\quad}, \underline{\quad})$   
 $(x_2, y_2) = (\underline{\quad}, \underline{\quad})$

**Added to Subtract**  
 $-2 + \underline{\quad} = 3$   
 $6 + \underline{\quad} = 9$

**Simplified**  
 $\underline{\quad} \div \underline{\quad} = 1$   
 $\underline{\quad} \div \underline{\quad} = 3$

**Find the value of the y-intercept**

$$y = mx + b$$

**Slope-Intercept Equation**  
slope =  $\underline{\quad}$ , y-intercept =  $\underline{\quad}$

$$-2 = \frac{1}{3} \cdot 6 + b$$

**Substituted Known Values**  
 $x_2 = \underline{\quad}$ ,  $y_2 = \underline{\quad}$ ,  
and  $m = \underline{\quad}$

$$-2 = 2 + b$$

**Multiplied to Simplify**  
 $\underline{\quad} \cdot \underline{\quad} = 2$

$$\underline{-2} \quad \underline{-2}$$

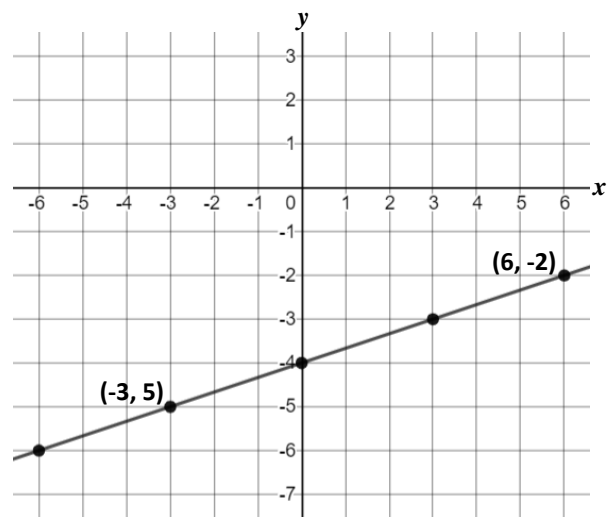
**Added to find b**  
 $\underline{\quad} + \underline{\quad} = -4$   
and  
 $\underline{\quad} + \underline{\quad} = 0$

$$-4 = b$$

**Conclusion:** The slope of the line is  $\underline{\quad}$  and the y-intercept is  $\underline{\quad}$ . Therefore, the equation of the line extending through points the (-3, -5) and (6, -2) is  $y = \underline{\quad}x + \underline{\quad}$ .

2. Verify the algebraic solution above by finding the value of the slope and y-intercept in the table and graph.

x	y
-6	-6
-3	-5
0	-4
3	-3
6	-2





**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

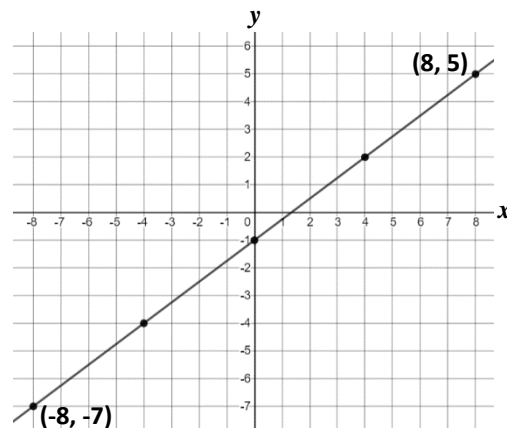
**Readiness** for graphing functions expressed symbolically

## Session 4: Guided Practice (Pairs)

3. Complete the algebraic steps to find the equation of the line through the points  $(-8, -7)$  and  $(8, 5)$ . Then check your work by finding the slope and y-intercept in the graph.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$



$$y = \boxed{\phantom{00}}x + \boxed{\phantom{00}}$$

4. Complete the algebraic steps to find the equation of the line through the points  $(-2, 8)$  and  $(1, 2)$ . Then check your work by finding the slope and y-intercept in the table.

Slope =

y =

x	y
-2	8
-1	6
0	4
1	2
2	0

$$y = \boxed{\phantom{00}}x + \boxed{\phantom{00}}$$

**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 4: Guided Practice (Teacher Notes)

1. Below are the algebraic steps to find the equation of the line through the points  $(-3, -5)$  and  $(6, -2)$ . For each solution step, discuss what happened and fill in the missing information.

<p style="text-align: center;"><b>Calculate the slope of the line given two points</b></p> $\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - -5}{6 - -3} = \frac{3}{9} = \frac{1}{3}$ <p style="text-align: center;"> <span style="margin-right: 100px;">↑</span> <b>Slope Formula</b> <span style="margin-right: 100px;">↑</span> <b>Substituted coordinates</b>  <math>(x_1, y_1) = (-3, -5)</math>  <math>(x_2, y_2) = (6, -2)</math> </p> <p style="text-align: center;"> <span style="margin-right: 100px;">↑</span> <b>Added to Subtract</b>  <math>-2 + \underline{5} = 3</math>  <math>6 + \underline{3} = 9</math> </p> <p style="text-align: center;"> <span style="margin-right: 100px;">↑</span> <b>Simplified</b>  <math>\underline{3} \div \underline{3} = 1</math>  <math>\underline{9} \div \underline{3} = 3</math> </p>	<p style="text-align: center;"><b>Find the value of the y-intercept</b></p> $y = mx + b$ <p style="text-align: right;"><b>Slope-Intercept Equation</b> slope = <u>m</u>, y-intercept = <u>b</u></p> $-2 = \frac{1}{3} \cdot 6 + b$ <p style="text-align: right;"><b>Substituted Known Values</b> <math>x_2 = \underline{6}</math>, <math>y_2 = \underline{-2}</math>, and <math>m = \frac{1}{3}</math></p> $-2 = 2 + b$ <p style="text-align: right;"><b>Multiplied to Simplify</b> <math>\frac{1}{3} \cdot \underline{6} = 2</math></p> $\underline{-2} \quad \underline{-2}$ <p style="text-align: right;"><b>Added to find b</b> <math>\underline{-2} + \underline{-2} = -4</math> and <math>\underline{2} + \underline{-2} = 0</math></p> $-4 = b$
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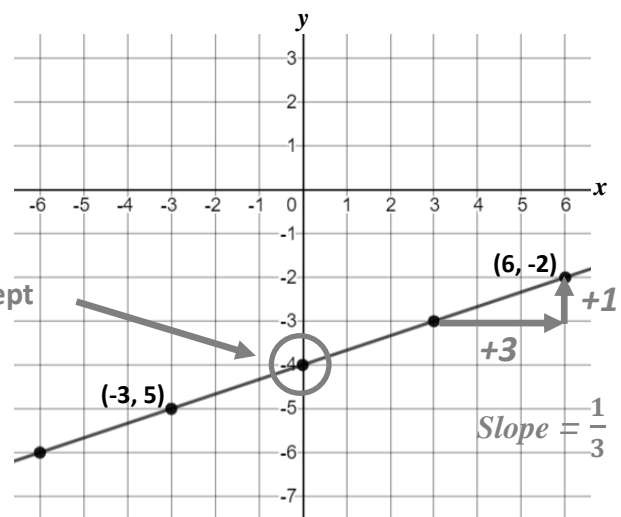
**Conclusion:** The slope of the line is  $\frac{1}{3}$  and the y-intercept is  $-4$ . Therefore, the equation of the line extending through points the  $(-3, -5)$  and  $(6, -2)$  is  $y = \frac{1}{3}x + -4$ ,

2. Verify the algebraic solution above by finding the value of the slope and y-intercept in the table and graph.

**Remember:**  
When  $x = 0$ , the line is crossing the y-axis

	x	y	
	-6	-6	
	-3	-5	
	0	<u>-4</u>	← y-intercept
	3	-3	
	6	-2	

$6 - 3 = 3$        $-2 - -3 = 1$   
 $\frac{1}{3}$        $\frac{1}{3}$   
**Slope =  $\frac{1}{3}$**



**Learning Target:** I will find the equation of a line

Algebra 1 – Readiness Standard 3 – 8.F.4

**Readiness** for graphing functions expressed symbolically

## Session 4: Guided Practice (Teacher Notes - Cont.)

3. Complete the algebraic steps to find the equation of the line through the points  $(-8, -7)$  and  $(8, 5)$ . Then check your work by finding the slope and y-intercept in the graph.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - -7}{8 - -8} = \frac{12}{16} = \frac{3}{4}$$

$$y = mx + b$$

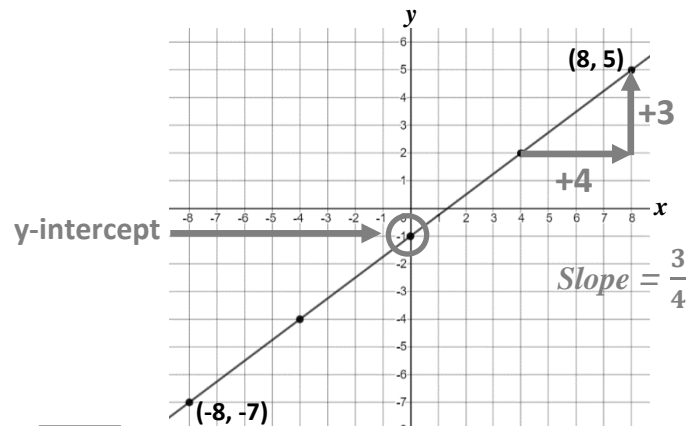
$$5 = \frac{3}{4} \cdot 8 + b$$

$$5 = 6 + b$$

$$\underline{-6} \quad \underline{-6}$$

$$-1 = b$$

$$y = \boxed{\frac{3}{4}}x + \boxed{-1}$$



4. Complete the algebraic steps to find the equation of the line through the points  $(-2, 8)$  and  $(1, 2)$ . Then check your work by finding the slope and y-intercept in the table.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 8}{1 - -2} = \frac{-6}{3} = -2$$

$$y = mx + b$$

$$2 = -2 \cdot 1 + b$$

$$2 = -2 + b$$

$$\underline{+2} \quad \underline{+2}$$

$$4 = b$$

$$y = \boxed{-2}x + \boxed{4}$$

x	y
-2	8
-1	6
0	4
1	2
2	0

The y-intercept is 4. The slope is calculated as  $\frac{2-1}{1-2} = \frac{1}{-1} = -2$ .



## Session 4: Self-Reflection

Algebra 1 – Readiness Standard 3 – 8.F.4

**Learning Target:** I will find the equation of a line

Briefly discuss student responses

- What did I learn today about finding the equation of a line?
  
- How confident do I feel about finding an equation of a line on my own?

*(Thumbs up, down, or sideways)*



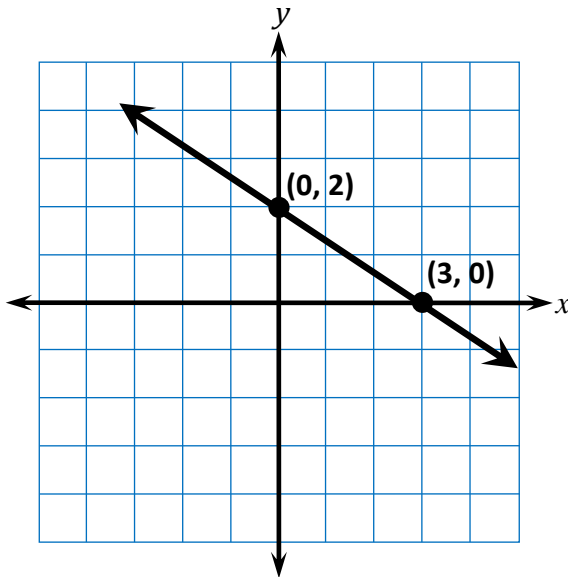
# Algebra 1 Quick Check – Form C

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
-2	0
-1	3
0	6
1	9
2	12

$$y = \square x + \square$$



# Algebra 1 Quick Check – Form C

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-4	-13
-2	-5
0	3
2	11
4	19

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-4, -5)$  and  $(2, 7)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(4, 5)$  and  $(12, 11)$

$$y = \square x + \square$$



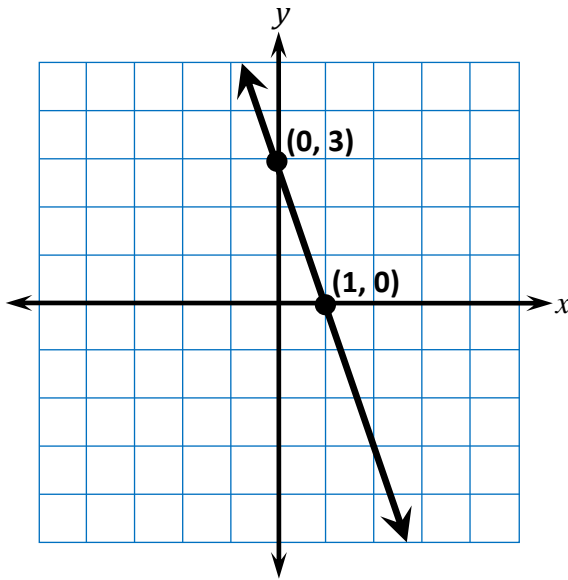
# Algebra 1 Quick Check – Form D

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
0	6
1	4
2	2
3	0
4	-2

$$y = \square x + \square$$





# Algebra 1 Quick Check – Form D

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-6	-7
-3	-1
0	5
3	11
6	17

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-2, -5)$  and  $(2, 11)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(5, 8)$  and  $(20, 14)$

$$y = \square x + \square$$



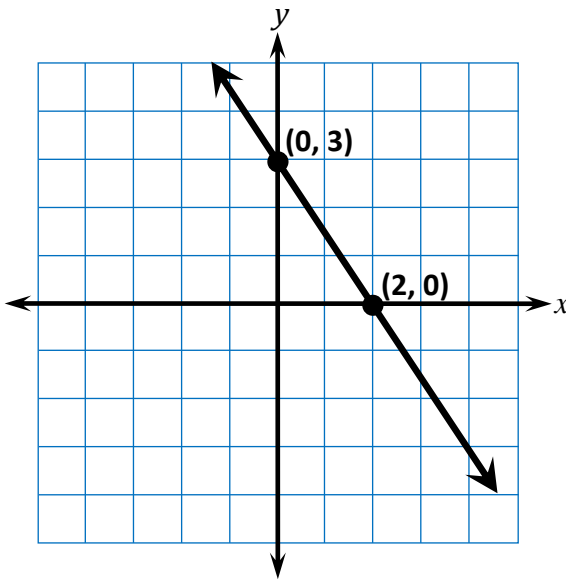
# Algebra 1 Quick Check – Form E

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
-1	6
0	4
1	2
2	0
3	-2

$$y = \square x + \square$$



# Algebra 1 Quick Check – Form E

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-2	-1
0	5
2	11
4	17
6	23

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-3, -2)$  and  $(4, 12)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(3, 9)$  and  $(15, 17)$

$$y = \square x + \square$$



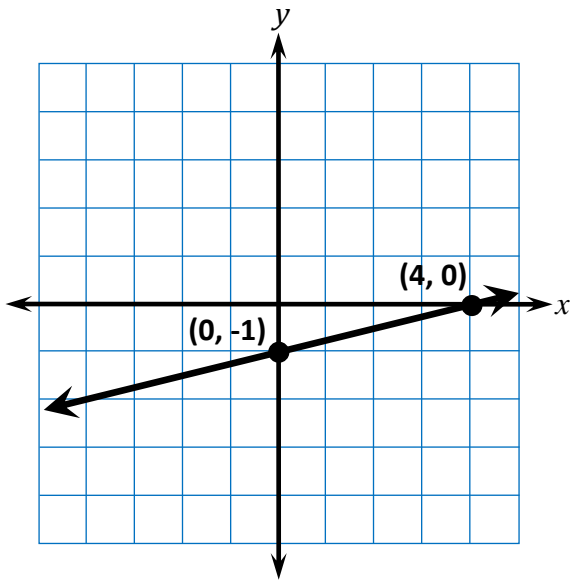
# Algebra 1 Quick Check – Form F

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
-3	0
-2	-3
-1	-6
0	-9
1	-12

$$y = \square x + \square$$



# Algebra 1 Quick Check – Form F

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-6	-28
-3	-13
0	2
3	17
6	32

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-3, -4)$  and  $(3, 14)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(5, 7)$  and  $(15, 13)$

$$y = \square x + \square$$



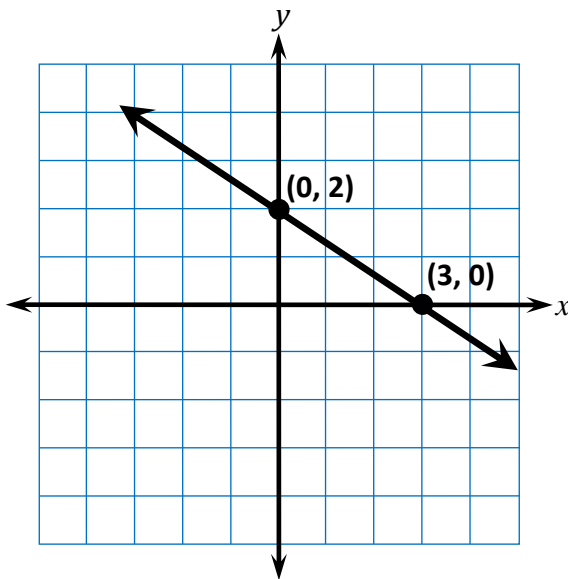
# Algebra 1 Quick Check – Form G

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
-2	0
-1	3
0	6
1	9
2	12

$$y = \square x + \square$$



# Algebra 1 Quick Check – Form G

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-4	-13
-2	-5
0	3
2	11
4	19

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-4, -5)$  and  $(2, 7)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(4, 5)$  and  $(12, 11)$

$$y = \square x + \square$$



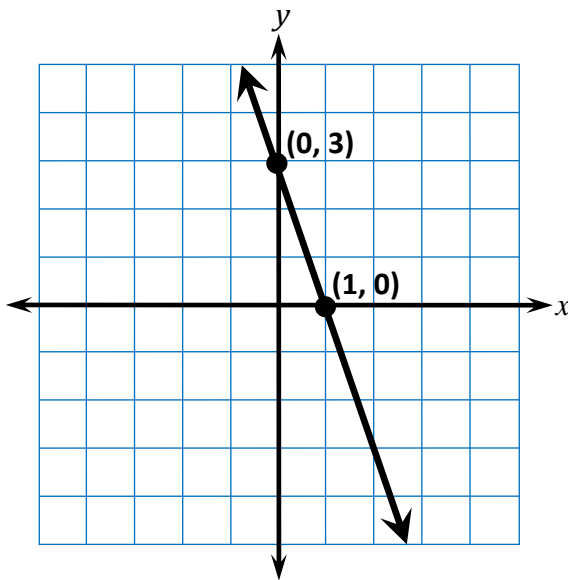
# Algebra 1 Quick Check – Form H

Readiness Standard 3 - 8.F.4

Name \_\_\_\_\_ Date \_\_\_\_\_

**Learning Target:** I will find the equation of a line. (Work time: 5 minutes)

1. Complete the equation of the line represented in the graph.



$$y = \square x + \square$$

2. Complete the equation of the line represented in the table.

$x$	$y$
0	6
1	4
2	2
3	0
4	-2

$$y = \square x + \square$$





# Algebra 1 Quick Check – Form H

Readiness Standard 3 - 8.F.4 (continued)

3. Complete the equation of the line represented in the table.

$x$	$y$
-6	-7
-3	-1
0	5
3	11
6	17

$$y = \square x + \square$$

4. Complete the equation of the line that contains the two points.

$(-2, -5)$  and  $(2, 11)$

$$y = \square x + \square$$

5. Complete the equation of the line that contains the two points.

$(5, 8)$  and  $(20, 14)$

$$y = \square x + \square$$