Finding Linear Functions

Bell Work:

1. **What is the point-slope formula?**
2. **What is the slope formula?**
3. **What is the point-slope form of a line that goes through (-8, 3) and has a slope of $\frac{2}{3}$?**
4. **What is the slope-intercept form of a line that goes through (-8, 3) and has a slope of $\frac{2}{3}$?**

Finding Linear Functions

Today, you are going to write linear functions.

$y = \frac{2}{3}x - 7$

$y = -x + 5$

$y = \frac{4}{7}x - 3$

$y = \frac{5}{2}x - \frac{8}{3}$

$y = \frac{3}{4}x + \frac{15}{2}$

Finding Linear Functions

1. What is the slope-intercept form of the linear function that goes through (8, -3) and (-4, 12)?

Find the slope using the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{12 - (-3)}{-4 - 8}$$

$$m = \frac{15}{-12} = -\frac{5}{4}$$

Use the point-slope formula and substitute the numbers into it.

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

$$y - -3 = -\frac{5}{4}(x - 8)$$ ***Use either point.***

$$y + 3 = -\frac{5}{4}x + 10$$ ***Change to slope-intercept form.***

$$y = -\frac{5}{4}x + 7$$

Finding Linear Functions

1. What is the slope-intercept form of the linear function that goes through (8, -3) and (-4, 12)?

Find the slope using the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{12 - (-3)}{-4 - 8}$$

$$m = \frac{15}{-12} = -\frac{5}{4}$$

Use the point-slope formula and substitute the numbers into it.

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

$$y - 12 = -\frac{5}{4}(x - -4)$$ ***Let's use the other point.***

$$y - 12 = -\frac{5}{4}x - 5$$ ***Change to slope-intercept form.***

$$y = -\frac{5}{4}x + 7$$ ***Same answer.***

Finding Linear Functions

2. What is the slope-intercept form of the linear function that goes through (-5, -11) and (3, 9)?

Find the slope using the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{9 - -11}{3 - (-5)}$$

$$m = \frac{20}{8} = \frac{5}{2}$$

Use the point-slope formula and substitute the numbers into it.

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

$$y - 9 = \frac{5}{2}(x - 3)$$

Use either point.

$$y - 9 = \frac{5}{2}x - \frac{15}{2}$$

Change to slope-intercept form.

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

Finding Linear Functions

3. What is the slope-intercept form of the linear function with the following table?

x	-6	-3	0	3	6	9	12
y	-9	-5	-1	3	7	11	15

Find the slope using the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{3 - -1}{3 - 0}$$

Use any 2 points.

$$m = \frac{4}{3}$$

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

If 0 is in the domain, use the y number that goes with 0.

Finding Linear Functions

4. What is the slope-intercept form of the linear function with the following table?

x	-8	-4	0	4	8	12	16
y	15	13	11	9	7	5	3

Find the slope using the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{9 - 11}{4 - 0}$$

Use any 2 points.

$$m = \frac{-2}{4} = -\frac{1}{2}$$

$$y = -\frac{1}{2}x + 11$$

If 0 is in the domain, use the y number that goes with 0.

Finding Linear Functions

5. What is the slope-intercept form of the linear function with the following table?

x	-8	-3	2	7	12	17	22
y	9	7	5	3	1	-1	-3

Find the slope using the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{3 - 5}{7 - 2}$$ *Use any 2 points.*

$$m = \frac{-2}{5} = -\frac{2}{5}$$

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

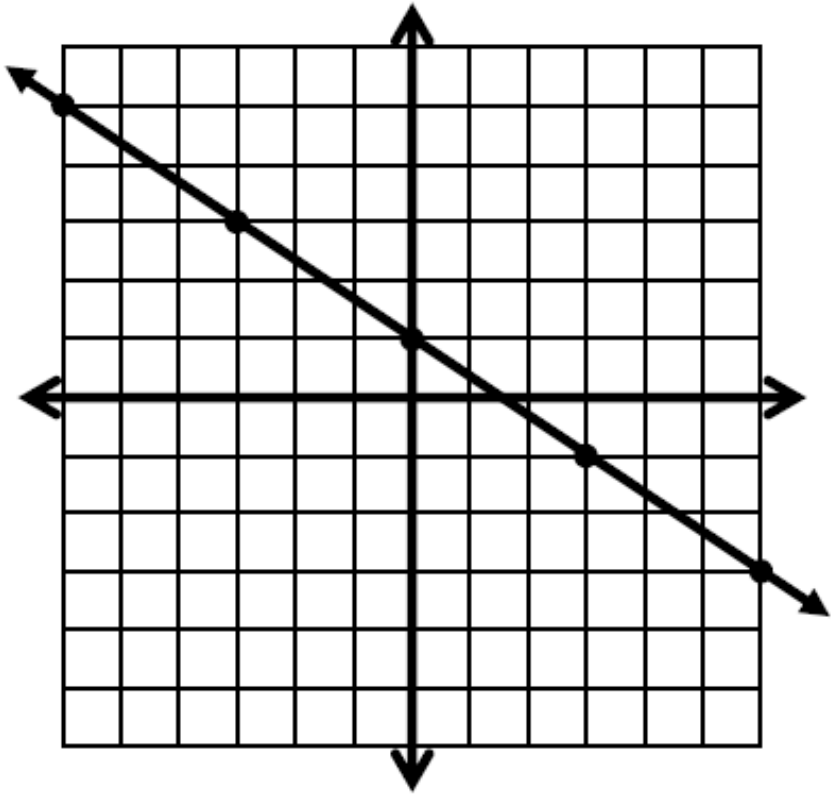
$$y - 5 = -\frac{2}{5}(x - 2)$$ *Use any point.*

$$y - 5 = -\frac{2}{5}x + \frac{4}{5}$$ *Change to slope-intercept form.*

$$y = -\frac{2}{5}x + \frac{29}{5}$$

Finding Linear Functions

6. **What is the slope-intercept form of the linear function with the following graph?**



Slope = $\frac{rise}{run}$

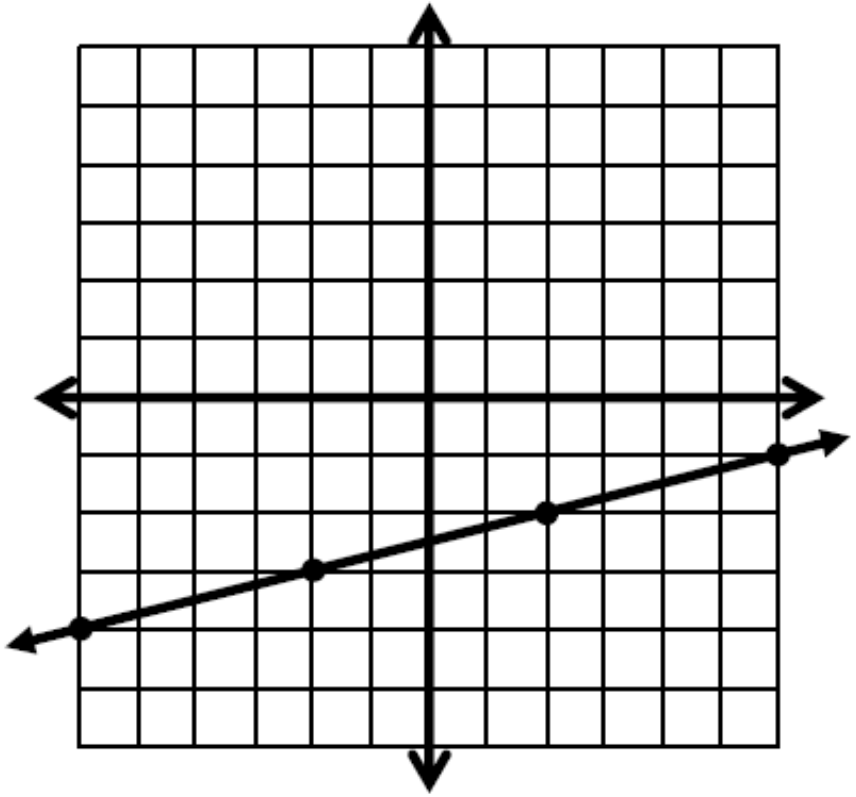
$$m = -\frac{2}{3}$$

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

Use the *y*-intercept of (0, 1)

Finding Linear Functions

7. What is the slope-intercept form of the linear function with the following graph?



Slope = $\frac{rise}{run}$

$$m = \frac{1}{4}$$

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

$$y + 2 = \frac{1}{4}(x - 2)$$ ***Use any point.***

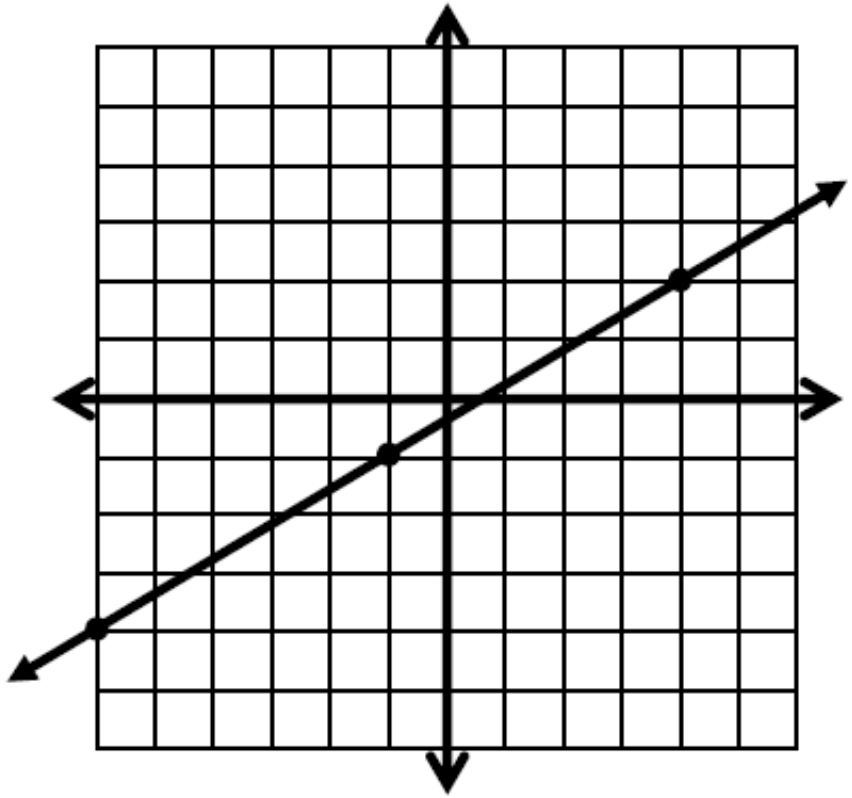
Change to slope-intercept form.

$$y + 2 = \frac{1}{4}x - \frac{1}{2}$$

$$y = \frac{1}{4}x - \frac{5}{2}$$

Finding Linear Functions

8. What is the slope-intercept form of the linear function with the following graph?



Slope = $\frac{rise}{run}$

$$m = \frac{3}{5}$$

Change to slope-intercept form.

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

$$y - 2 = \frac{3}{5}(x - 4)$$ ***Use any point.***

$$y - 2 = \frac{3}{5}x - \frac{12}{5}$$

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

Finding Linear Functions

1. Find the slope using the slope formula.
2. Use the point-slope formula.
3. Change to slope-intercept form.

Finding Linear Functions

Assignment:

Finding Slope-Intercept Functions from 2 Points, Tables, or Graphs Worksheet