

Bell Work

1. Solve and show all work. $6f - 10 = 3(f + 4)$

2. Solve, show all work, and write in interval notation. $2(g - 3) \geq 6g + 5$

3. What is one way to represent a number relationship?

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

In today's lesson, you will write linear equations in point-slope and slope-intercept forms.

$$y - 6 = \frac{1}{3}(x - 3)$$

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

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

$$y - 1 = 4(x + 5)$$

3 things are needed to write linear functions:

1. Point: $(-6, 3)$

2. Slope: $\frac{2}{3}$

3. Point-Slope Formula:

$$y - \underline{y_1} = \underline{m}(x - \underline{x_1})$$

The y_1 , m , and x_1 will change to numbers.

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

Point-Slope Form

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

$$\begin{array}{r} + 3 \qquad \qquad + 3 \\ \hline \end{array}$$

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

Slope-Intercept Form

3 things are needed to write linear functions:

1. Point: $(8, -1)$

2. Slope: $-\frac{5}{4}$

3. Point-Slope Formula:

$$y - \underline{y_1} = \underline{m}(x - \underline{x_1})$$

The y_1 , m , and x_1 will change to numbers.

$$y + + 1 = -\frac{5}{4}(x - 8)$$

Point-Slope Form

$$y + 1 = -\frac{5}{4}x + 10$$

$$\begin{array}{r} -1 \qquad \qquad \qquad -1 \\ \hline \end{array}$$

$$y = -\frac{5}{4}x + 9$$

Slope-Intercept Form

x	-3	3	6	12	24
y	4	6	7	9	13

Slope Formula:

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

$$m = \frac{7 - 6}{6 - 3} = \frac{1}{3}$$

Pick 2 numbers and use the slope formula to find the slope.

Point-Slope Formula:

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

The y_1 , m , and x_1 will change to numbers.

$$y - 6 = \frac{1}{3}(x - 3)$$

Point-Slope Form

$$y - 6 = \frac{1}{3}x - 1$$

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

Slope-Intercept Form

x	-10	-6	2	6	14
y	-11	-5	7	13	25

Slope Formula:

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

$$m = \frac{13 - 7}{6 - 2} = \frac{6}{4} = \frac{3}{2}$$

Pick 2 numbers and use the slope formula to find the slope.

Point-Slope Formula:

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

The y_1 , m , and x_1 will change to numbers.

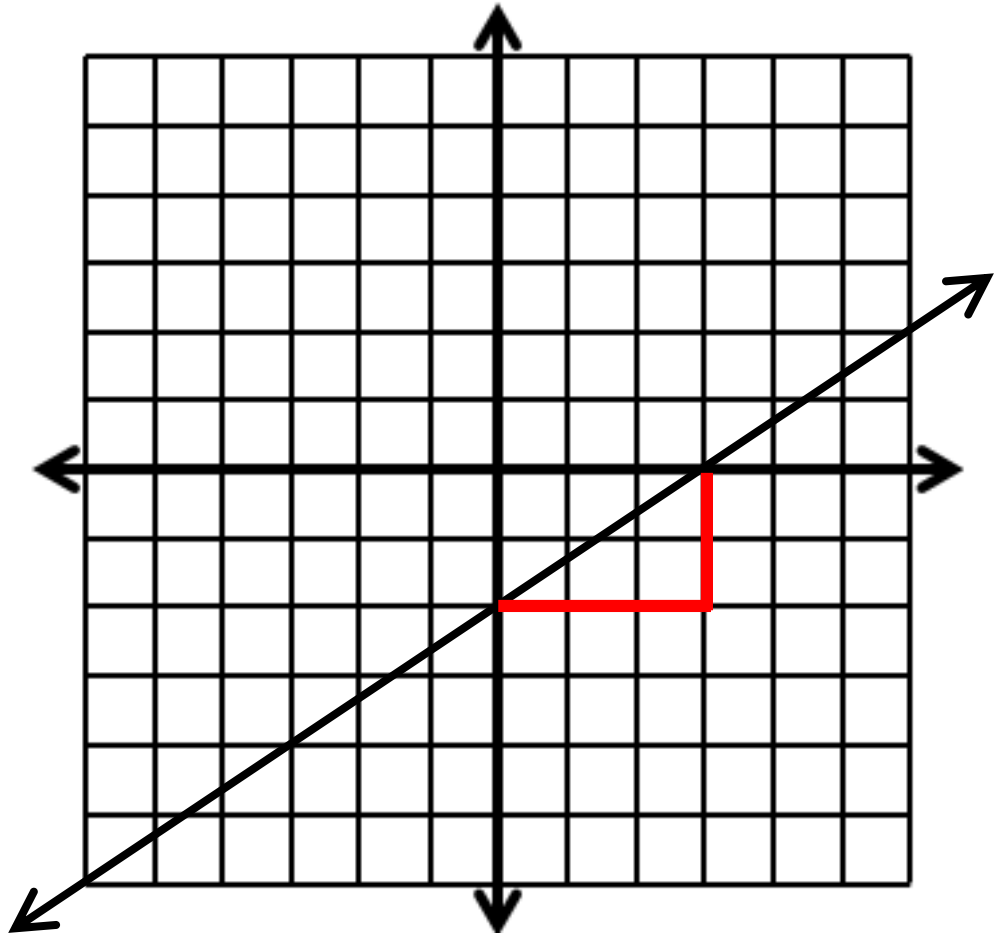
$$y - 7 = \frac{3}{2}(x - 2) \quad \text{Point-Slope Form}$$

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

$$\begin{array}{r} +7 \\ +7 \end{array}$$

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

Slope-Intercept Form



Draw a right triangle with the line. The rise is the height of the triangle and the run with the width of the triangle.

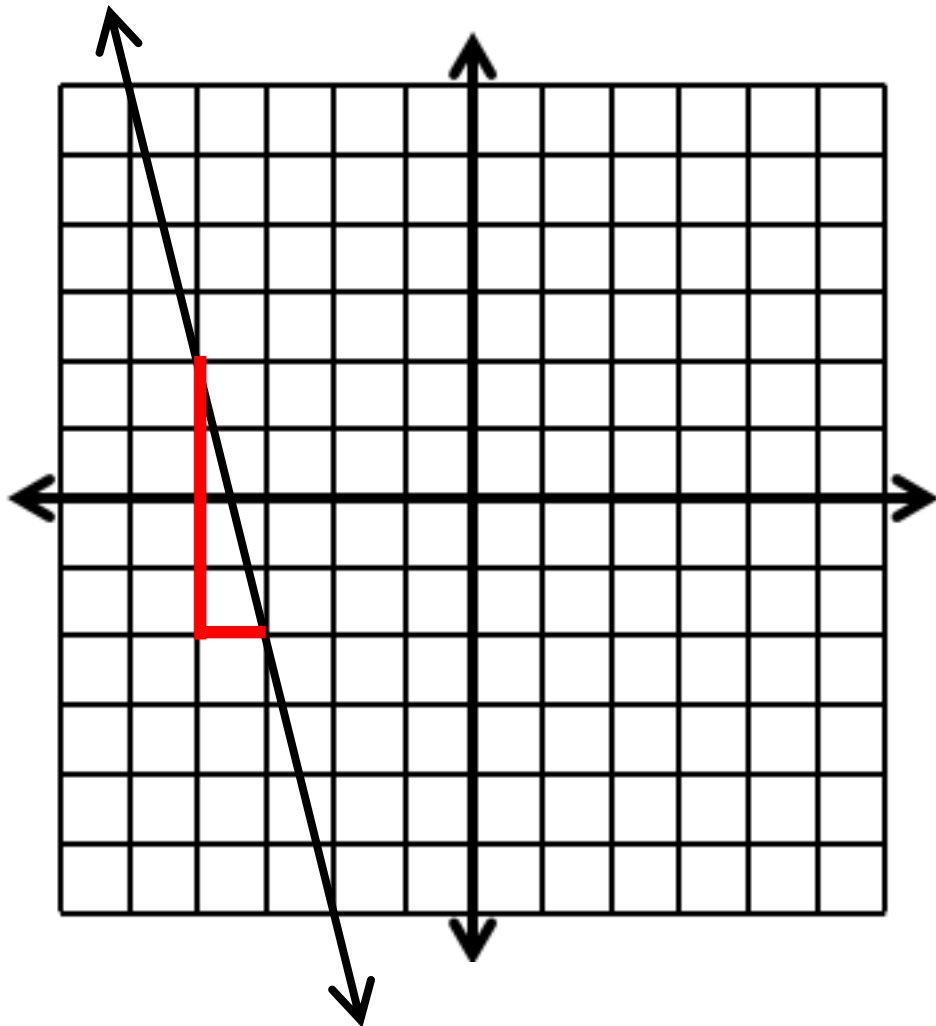
$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{2}{3}$$

The line goes up to the right and down to the left, so it is positive.

y-intercept: (0, -2)

It goes through the y-axis at (0, -2).

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



$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = -\frac{4}{1}$$

The line goes up to the left and down to the right, so it is negative.

Pick a point.

y-intercept: $(-4, 2)$

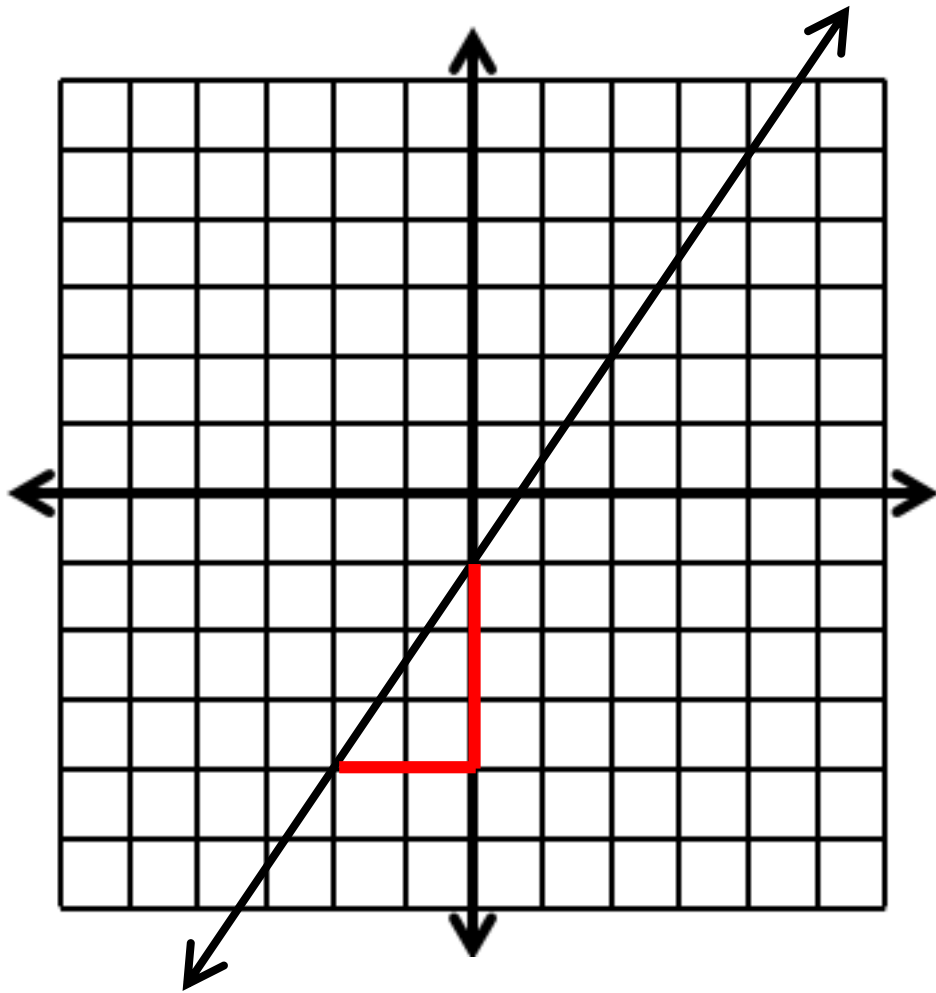
Use the Point-Slope Formula

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

$$y - 2 = -4x - 16$$

$$y = -4x - 14$$

Draw a right triangle with the line. The rise is the height of the triangle and the run with the width of the triangle.



Draw a right triangle with the line. The rise is the height of the triangle and the run with the width of the triangle.

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{3}{2}$$

The line goes up to the right and down to the left, so it is positive.

y-intercept: (0, -1)

It goes through the y-axis at (0,-2).

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

Point-Slope Formula:

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

Slope Formula:

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

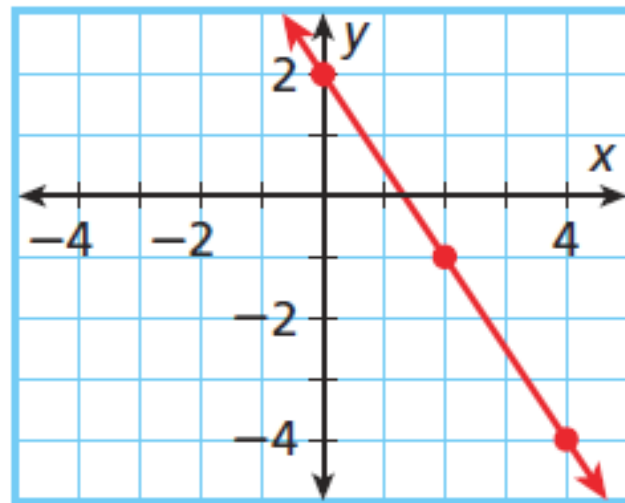
Assignment:

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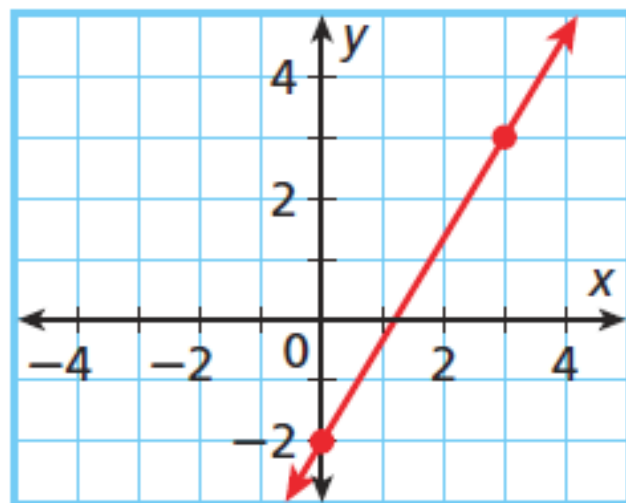
(Write in slope-intercept form)

Write the equation of each line in slope-intercept form.

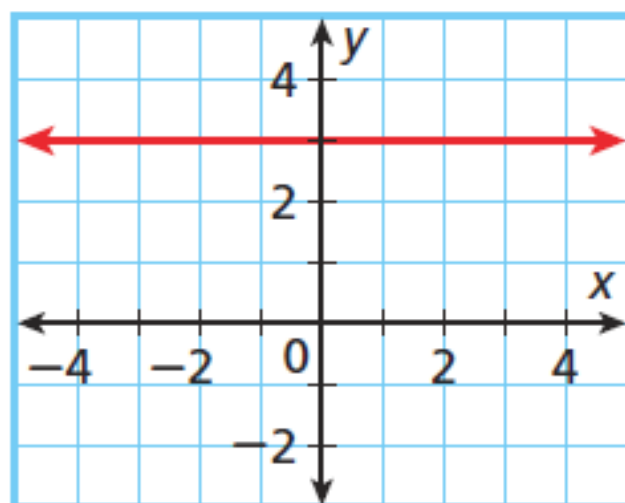
12.



13.



14.



Find the slope of each line.

15.

x	0	1	2	3
y	$-\frac{1}{3}$	$\frac{1}{3}$	1	$\frac{5}{3}$

16. line \overleftrightarrow{AB} through $A(-1, 3)$ and $B(1, -4)$

Write the equation of each line in slope-intercept form.

17. passing through $(3, 11)$ with slope $\frac{7}{3}$

18.

x	10	15	20	25
y	-2	-7	-12	-17

Write in slope-intercept form.

For Exercises 29–37, write the equation of the line with the given properties.

29. a slope of 4 passing through $(1, 7)$

30. a slope of $-\frac{1}{2}$ passing through $(7, -3)$

31. passing through $(-5, 7)$ and $(3, -4)$

32. passing through $(-3, 3)$ and $(1, -1)$

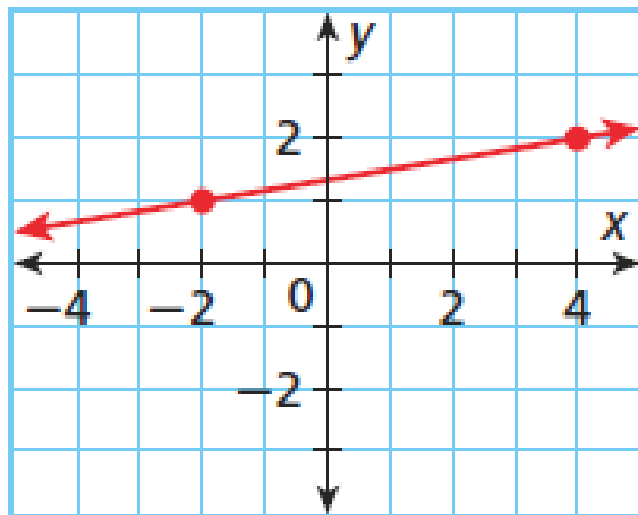
33.

x	4	7.5	8
y	44	117.5	128

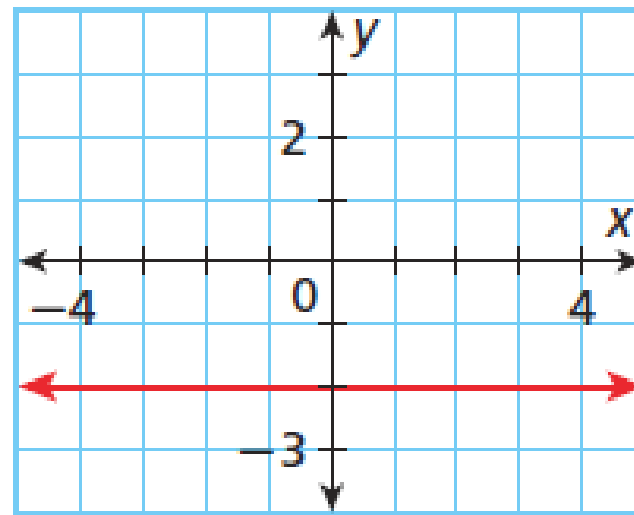
34.

x	0	30	100
y	32	86	212

35.



36.



37.

