

Make a table of points and plot them in a coordinate plane.

Connect the points with a line.

1. $y = -2x - 3$

2. $y = 6x + 6$

3. $-x - 2y = 3$

4. $-4x = 7 + 2y$

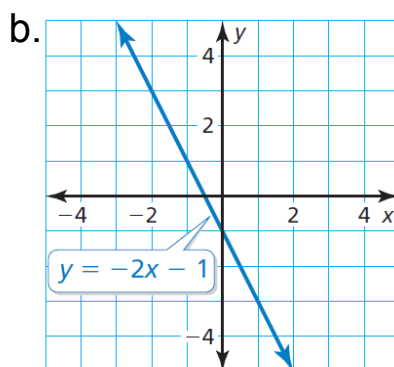
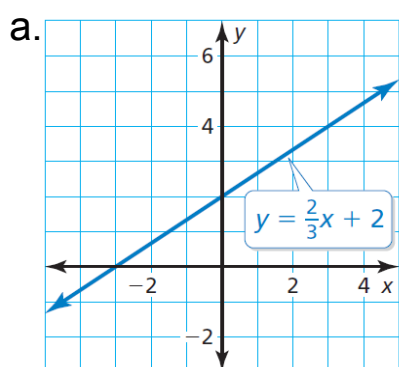
5. $y = 5x$

6. $y = 0$

Essential Question

How can you describe the graph of the equation $y = mx + b$?

Work with a partner. Find the slope and y-intercept of each line.



Work with a partner. Graph each equation. Then copy and complete the table. Use the completed table to write a conjecture about the relationship between the graph of $y = mx + b$ and the values of m and b .

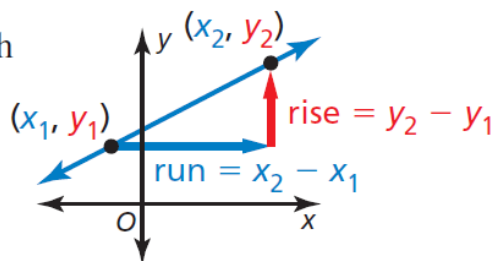
Equation	Description of graph	Slope of graph	y -Intercept
a. $y = -\frac{2}{3}x + 3$	Line	$-\frac{2}{3}$	3
b. $y = 2x - 2$			
c. $y = -x + 1$			
d. $y = x - 4$			

Core Concept

Slope

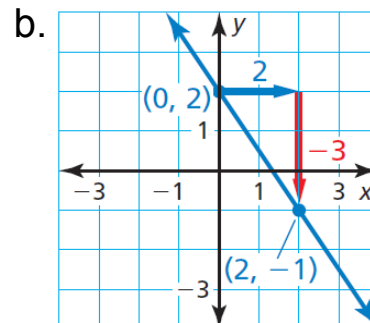
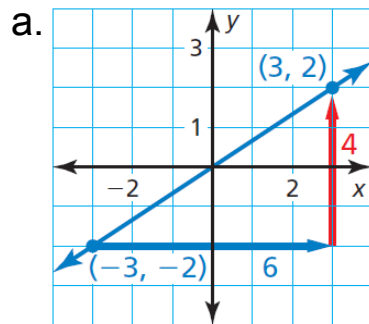
The **slope** m of a nonvertical line passing through two points (x_1, y_1) and (x_2, y_2) is the ratio of the **rise** (change in y) to the **run** (change in x).

$$\text{slope} = m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

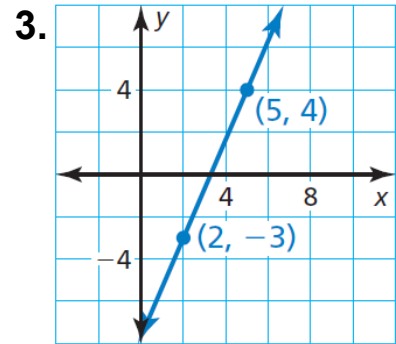
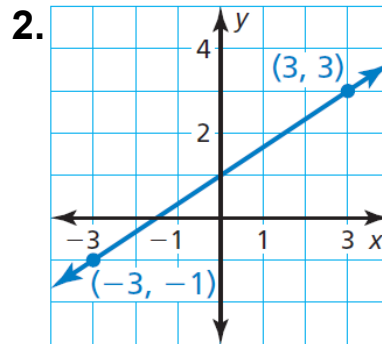
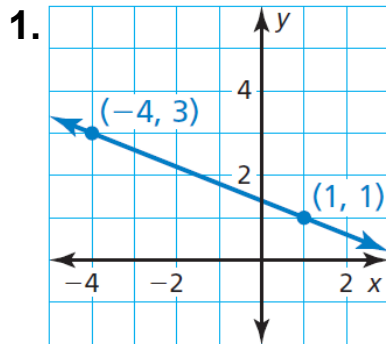


When the line rises from left to right, the slope is positive. When the line falls from left to right, the slope is negative.

Describe the slope of each line. Then find the slope.



Describe the slope of the line. Then find the slope.



slope of each line from the table: what is the slope of each line:

a.

x	y
4	20
7	14
10	8
13	2

b.

x	y
-1	2
1	2
3	2
5	2

c.

x	y
-3	-3
-3	0
-3	6
-3	9

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 2}{5 - -1} = \frac{0}{6} = 0$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 9}{-3 - -3} = \frac{-12}{0} \text{ Undefined}$$

The points represented by the table lie on a line. How can you find the slope of the line from the table? What is the slope of the line?

4.

x	2	4	6	8
y	10	15	20	25

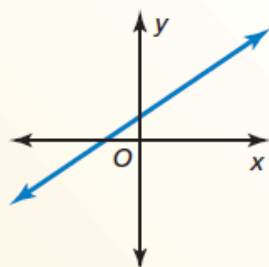
5.

x	5	5	5	5
y	-12	-9	-6	-3

Concept Summary

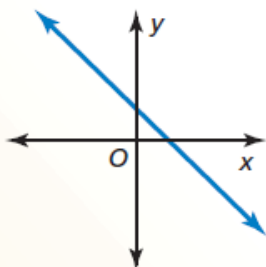
Slope

Positive slope



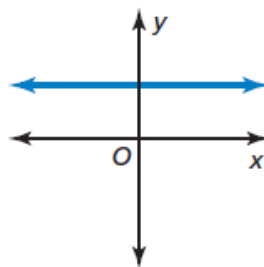
The line rises
from left to right.

Negative slope



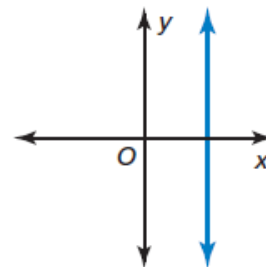
The line falls
from left to right.

Slope of 0



The line is
horizontal.

Undefined slope



The line
is vertical.

$$y = mx + b$$

↙ slope

y-int
(0, b)

$$Ax + By = C$$

$$5x - y = 10$$

+ y + y

$$5x = 10 + y$$

-10 -10

$$y = 5x - 10$$

$$4x - 2y = 8$$

$$-4x$$

$$-2y = -4x + 8$$

-2 -2

$$y = 2x - 4$$

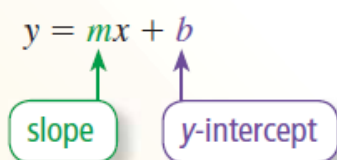
Core Concept

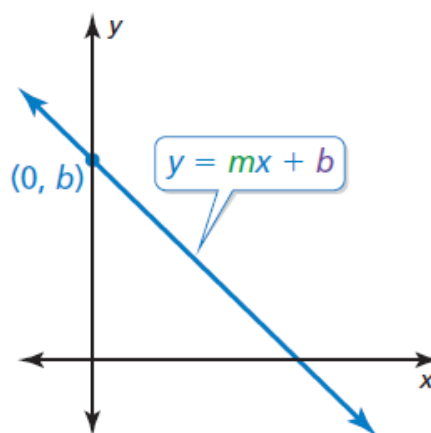
Slope-Intercept Form

Words A linear equation written in the form $y = mx + b$ is in **slope-intercept form**. The slope of the line is m , and the y-intercept of the line is b .

Algebra

$$y = mx + b$$





Find the slope and the y -intercept of the graph of each linear equation.

a. $y = 3x - 4$

b. $y = 6.5$

c. $-5x - y = -2$

Graph $2x + y = 2$. Identify the x-intercept.

A submersible that is exploring the ocean floor begins to ascend to the surface. The elevation h (in feet) of the submersible is modeled by the function $h(t) = 650t - 13,000$, where t is the time (in minutes) since the submersible began to ascend.

a. Graph the function and identify its domain and range.

b. Interpret the slope and the intercepts of the graph.

Point of Most Significance: Ask students to identify, aloud or on a paper to be collected, the most significant point (or part) in the lesson that aided their learning.