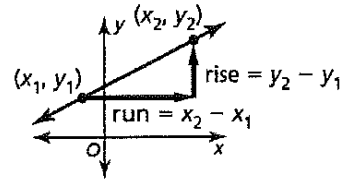


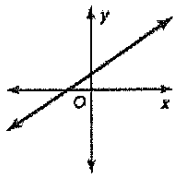
3.5 Graphing Linear Equations in Slope-Intercept Form

slope

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

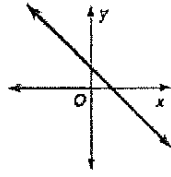


Positive slope



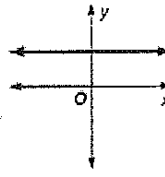
The line rises from left to right.

Negative slope



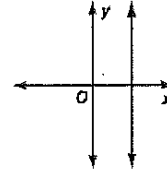
The line falls from left to right.

Slope of 0



The line is horizontal.

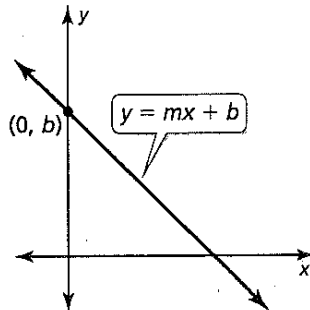
Undefined slope



The line is vertical.

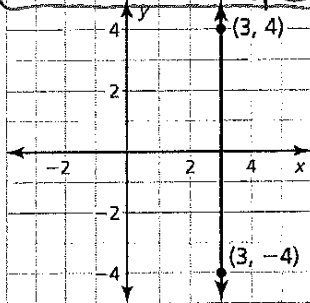
Slope-Intercept Form

$$y = mx + b$$



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

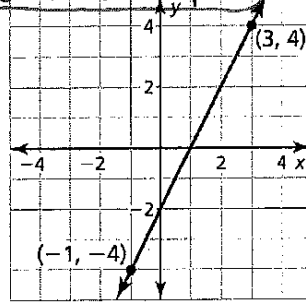
1. **Undefined slope**



(3, 4) and (3, -4)

$$m = \frac{-4 - 4}{3 - 3} = \frac{-8}{0} = \text{undefined}$$

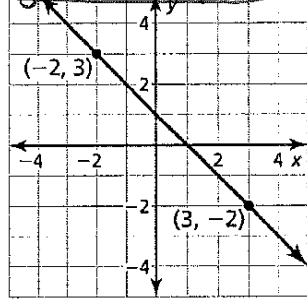
2. **positive slope**



(-1, -4) and (3, 4)

$$m = \frac{4 - (-4)}{3 - (-1)} = \frac{8}{4} = 2$$

3. **negative slope**



(-2, 3) and (3, -2)

$$m = \frac{-2 - 3}{3 - (-2)} = \frac{-5}{5} = -1$$

The points represented by the table lie on a line. Find the slope of the line.

4.

	+1	+1	+1	
x	1	2	3	4
y	-2	-2	-2	-2

to to to

$$\frac{\Delta y}{\Delta x} = \frac{0}{1} = \boxed{0}$$

5.

	+2	+2	+2	
x	-3	-1	1	3
y	11	3	-5	-13

-8 -8 -8

$$\frac{\Delta y}{\Delta x} = \frac{-8}{2} = \boxed{-4}$$

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

6. $6x + 4y = 24$

$-6x$ $-6x$

$$\frac{4y}{4} = \frac{-6x + 24}{4}$$

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

$$m = -\frac{3}{2} \quad b = 6$$

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

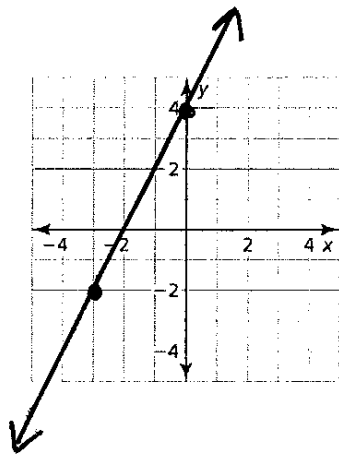
$$m = -\frac{3}{4} \quad b = 2$$

8. $y = 5x$

$$m = 5 \quad b = 0$$

9. A linear function f models a relationship in which the dependent variable decreases 6 units for every 3 units the independent variable decreases. The value of the function at 0 is 4. Graph the function. Identify the slope, y-intercept, and x-intercept of the graph.

(0, 4)



ind	dep
-3 < 0	4 > -6
-3	-2
-6	-8
-9	-14

$$\text{slope} = \frac{-6}{-3} = 2$$

$$\text{y-int} = (0, 4)$$

$$\text{x-int} = (-2, 0)$$