

Objective 14

Rewrite a linear equation in slope-intercept form

Vocab:

Slope-intercept form: the most common form of writing a linear equation, where m stands for slope and b represents the y -intercept of the equation $y = mx + b$

PROBLEM

What is the slope-intercept form of the equation $2x - 8y = -6$?

STEP 1

Recall the slope-intercept form of a linear equation.

The slope-intercept form is $y = mx + b$, where m is the slope of the line and b is the y -intercept of the line.

STEP 2

Isolate the y -term by subtracting $2x$ from each side of the equation.

$$\begin{aligned}2x - 8y &= -6 \\2x - 8y - 2x &= -6 - 2x \\2x - 2x - 8y &= -2x - 6 \\-8y &= -2x - 6\end{aligned}$$

STEP 3

Divide each side of the equation by -8 . Simplify the result.

$$\begin{aligned}\frac{-8y}{-8} &= \frac{-2x - 6}{-8} \\y &= \frac{-2x}{-8} - \frac{6}{-8} \\&= \frac{\cancel{2}x}{\cancel{8}_4} - \left(\frac{3}{\cancel{8}_4} \right) \\&= \frac{1}{4}x - \left(-\frac{3}{4} \right) \\&= \frac{1}{4}x + \frac{3}{4}\end{aligned}$$

ANSWER

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

Guided Practice:

What is the slope-intercept form of the following equations?

$$8x - 7y - 17 = 0$$

$$5x + 9y = -7$$

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

Practice:

Rewrite each equation in slope-intercept form and state the slope and y-intercept of the line.

	slope-intercept form	slope	y-intercept
1. $3x + y = 5$	1. $y = -3x + 5$	-3	(0, 5)
2. $4x + 2y = 10$	2. $y = -2x + 5$	-2	(0, 5)
3. $6x + 3y = 18$	3. $y = -2x + 6$	-2	(0, 6)
4. $4x - y = 7$	4. $y = 4x - 7$	4	(0, -7)
5. $x + 5y = 2$	5. $y = -\frac{1}{5}x + \frac{2}{5}$	$-\frac{1}{5}$	$\left(0, \frac{2}{5}\right)$
6. $3x - 2y = 6$	6. $y = \frac{3}{2}x - 3$	$\frac{3}{2}$	(0, -3)
7. $4x + 8y = 2$	7. $y = -\frac{1}{2}x + \frac{1}{4}$	$-\frac{1}{2}$	$\left(0, \frac{1}{4}\right)$
8. $-x - y = -2$	8. $y = -x + 2$	-1	(0, 2)
9. $3x + 3y = 2$	9. $y = -x + \frac{2}{3}$	-1	$\left(0, \frac{2}{3}\right)$
10. $5x - 2y = 4$	10. $y = \frac{5}{2}x - 2$	$\frac{5}{2}$	(0, -2)

Additional Help:

http://www.columbia.edu/itc/sipa/math/slope_intercept.html

<https://www.youtube.com/watch?v=LO02fndLdwU>