4.1 Writing Equations in Slope-Intercept Form with work

Algebra 4.1: Writing equations in slope-intercept form (y = mx + b)

Learning Outcomes: I can write equations in slope-intercept form.

I can use linear equations to solve real-life problems.

$y = mx + b$

m = slope b = y-int.

Example 1:

Write an equation of each line with the given slope and y-intercept.

a. slope = − 3; y-intercept $= \frac{1}{2}$

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

b. slope = 0; y-intercept = − 2

$y = 0 \cdot x + -2$

$y = -2$

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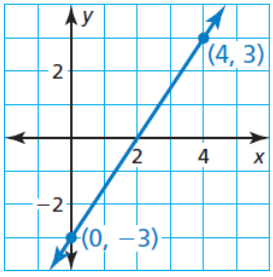
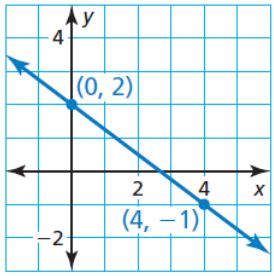
Example 2:

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

a.



b.



(0, −3)... y-int = −3

b = −3

slope $= \frac{6}{4} = \frac{3}{2} = m$

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

(0, 2)... y-int (b) = 2

slope $= -\frac{3}{4}$

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

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4.1 Writing Equations in Slope-Intercept Form with work

You try: **write an equation of the line with the given slope and *y*-intercept.**

4. slope: -3, *y*-intercept: 7

$y = -3x + 7$

5. slope: 4, *y*-intercept: -2

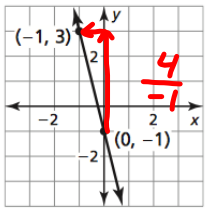
$y = 4x - 2$

6. slope: $\frac{1}{3}$, *y*-intercept: 2

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

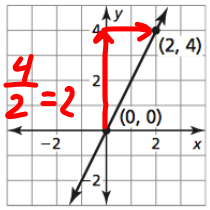
In Exercises 7–12, write an equation of the line in slope-intercept form.

7.



$y = -4x - 1$

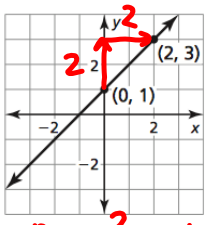
8.



$y = 2x + 0$

$y = 2x$

9.



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

$y = 1 \cdot x + 1$

$y = x + 1$

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Example 3:

Write an equation of each line that passes through the given points.

a. $(-3, 5), (0, -1)$

y-int (b) = −1

$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{5 - -1}{-3 - 0} = \frac{6}{-3} = -2$ = m

$y = -2x - 1$

b. $(0, -5), (8, -5)$

(0, −5) y-int

b = −5

$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{-5 - -5}{0 - 8} = \frac{0}{-8} = 0$ = m

$y = 0 \cdot x - 5$

$y = -5$

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4.1 Writing Equations in Slope-Intercept Form with work

You try:

In Exercises 13–18, write an equation of the line that passes through the given points. In slope-intercept form y=mx+b

13. $(3, -1), (8, 4)$

14. $(2, 1), (3, 5)$

15. $(0, 2), (4, 3)$

$b = 2$

$m = \frac{3-2}{4-0} = \frac{1}{4}$

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

16. $(-3, -2), (-4, -1)$

17. $(8, 0), (0, 8)$

$b = 8$

$m = \frac{8-0}{0-8} = \frac{8}{-8} = -1$

$y = -1x + 8$

$y = -x + 8$

18. $(-1, 7), (2, -5)$

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Example 4:

Write a linear function f with the values f(0) = 10 and f(6) = 34.

$(0, 10)$

$(6, 34)$

y-int = 10

$m = \frac{\Delta y}{\Delta x} = \frac{34-10}{6-0} = \frac{24}{6} = 4$

$y = 4x + 10$

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Example 5:

The corresponding data for electricity generated by hydropower are 248 million megawatt hours in 2007 and 277 million megawatt hours in 2012. Write a linear model that represents the number of megawatt hours generated by hydropower as a function of the number of years since 2007.

$y = 5.8x + 248$

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