

LESSON
6.5

Study Guide

For use with pages 341–347

CA Standards
AF 3.3

Lesson 6.5

GOAL

Write and graph equations in slope-intercept form.

VOCABULARY

The **slope-intercept form** of a linear equation is $y = mx + b$, where m is the slope and b is the y-intercept.

EXAMPLE 1 Identifying Slopes and y-Intercepts

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

a. $y = x - 4$

b. $-6x + 3y = 15$

Solution

a. The equation $y = x - 4$ can be written as $y = 1x + (-4)$.



Answer: The line has a slope of 1 and a y-intercept of -4 .

b. Write the equation $-6x + 3y = 15$ in slope-intercept form.

$-6x + 3y = 15$

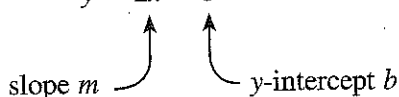
Write original equation.

$3y = 6x + 15$

Add $6x$ to each side.

$y = 2x + 5$

Divide each side by 3.



Answer: The line has a slope of 2 and a y-intercept of 5.

Exercises for Example 1

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

1. $y = 4x + 9$

2. $y = -3x + 1$

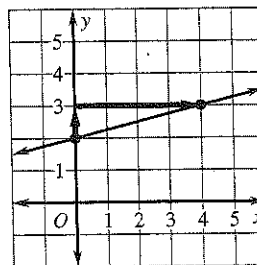
3. $-8x + 2y = 6$

EXAMPLE 2 Graphing Using Slope-Intercept Form

Graph the equation $y = \frac{1}{4}x + 2$.

Solution

- (1) The y-intercept is 2, so plot the point $(0, 2)$.
- (2) Use the slope, $\frac{1}{4}$, to plot a second point by moving up 1 unit and right 4 units.
- (3) Draw a line through the points.



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Exercises for Example 2

Use the slope and y-intercept to graph the equation.

4. $y = 3x + 1$

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

6. $y = -x + 4$

EXAMPLE 3 **Writing an Equation**

An appliance repair shop charges \$25 to make a house visit, and the total cost of the visit increases at a rate of \$30 for every hour the repairman is at a home. How can you find the total cost of a visit that lasts 3.5 hours?

Solution

- (1) Write a verbal model.

Total cost	=	Charge per hour	×	Number of hours	+	Charge for house visit
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- (2) Write an algebraic model in slope-intercept form.

The total cost increases at a rate of \$30 per hour, so $m = 30$. The initial cost is \$25, so $b = 25$. Let y be the total cost and let x be the number of hours of a visit.

$$y = mx + b \quad \text{Write slope-intercept form.}$$

$$y = 30x + 25 \quad \text{Substitute 30 for } m \text{ and 25 for } b.$$

- (3) To find the total cost after 3.5 hours, find the value of
- y
- when
- $x = 3.5$
- .

$$y = 30x + 25 \quad \text{Write the equation.}$$

$$= 30(3.5) + 25 \quad \text{Substitute 3.5 for } x.$$

$$= 130 \quad \text{Simplify.}$$

Answer: The cost for a visit that lasts 3.5 hours is \$130.

Exercise for Example 3

7. You are selling potted houseplants at a school sale. It costs you \$50 for supplies, and you are selling the plants for \$4 each.
- Write an equation to model your profit.
 - How much money will you make if you sell 10 plants? 15 plants? 20 plants? 25 plants?