

Reteaching with Practice

For use with pages 308–314

GOAL

Write a linear equation in standard form and use the standard form of an equation to model real-life situations

VOCABULARYIn the **standard form** of the equation of a line, $Ax + By = C$, where A , B , and C represent integers and A and B are not both zero.**EXAMPLE 1****Writing an Equation in Standard Form**Write $y = -\frac{3}{4}x + 5$ in standard form with integer coefficients.**SOLUTION**

To write the equation in standard form, isolate the variable terms on the left and the constant term on the right.

$$y = -\frac{3}{4}x + 5 \quad \text{Write original equation.}$$

$$4y = 4\left(-\frac{3}{4}x + 5\right) \quad \text{Multiply each side by 4.}$$

$$4y = -3x + 20 \quad \text{Use distributive property.}$$

$$3x + 4y = 20 \quad \text{Add } 3x \text{ to each side.}$$

Exercises for Example 1

Write the equation in standard form with integer coefficients.

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

2. $y = 8 + 2x$

3. $y = 6 - \frac{1}{4}x$

EXAMPLE 2**Writing a Linear Equation**Write the standard form of the equation passing through $(3, 7)$ with a slope of 2.**SOLUTION**

Write the point-slope form of the equation of the line.

$$y - y_1 = m(x - x_1) \quad \text{Write point-slope form.}$$

$$y - 7 = 2(x - 3) \quad \text{Substitute for } y_1, m, \text{ and } x_1.$$

$$y - 7 = 2x - 6 \quad \text{Use distributive property.}$$

$$-2x + y = 1 \quad \text{Add } -2x \text{ and } 7 \text{ to each side.}$$

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Exercises for Example 2

Write the standard form of the equation of the line that passes through the given point and has the given slope.

4. $(1, 4)$, $m = -2$

5. $(-3, 1)$, $m = 3$

6. $(5, -2)$, $m = -1$

EXAMPLE 3 Writing and Using a Linear Model

You have \$12 to buy peaches and blueberries for a fruit salad. Peaches cost \$1.50 per pound and blueberries cost \$4.00 per pound. Write a linear equation that models the different amounts of peaches x and blueberries y that you can buy.

SOLUTION

Verbal Model	Price of peaches	·	Weight of peaches	+	Price of blueberries	·	Weight of blueberries	=	Total cost
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Labels Price of peaches = 1.50 (dollars per pound)

Weight of peaches = x (pounds)

Price of blueberries = 4 (dollars per pound)

Weight of blueberries = y (pounds)

Total cost = 12 (dollars)

Algebraic Model

$1.50x + 4y = 12$ Linear model

Exercise for Example 3

7. Copy and complete the table using the linear model in Example 3.

Peaches (lb), x	0	2	4	8
Blueberries (lb), y	?	?	?	?