Name Key Date

4.3 NOTES
Writing Equations in Standard Form

Write the meaning of each vocabulary term.

standard form

An equation for a line written as $Ax + By = C$ where $A, B, C \in \mathbb{R}$ and $A \neq B$ are not both zero.

equivalent equation

Equations that have the same solutions

point-slope form

An equation for a line written with the slope & a point

$y - y_1 = m(x - x_1)$

In Exercises 1 and 2, write two equations in standard form that are equivalent to the given equation.

1. $x - y = 4$

$3(x - y) = (4)3$

$3x - 3y = 12$

$10(x - y) = 10(4)$

$10x - 10y = 40$

2. $3x + y = -12$

$2(3x + y) = 2(-12)$

$6x + 2y = -24$

$5(3x + y) = 5(-12)$

$15x + 5y = -60$

In Exercises 3 and 4, write an equation in standard form of the line that passes through the given point and has the given slope.

3. $(3, 1)$; $m = 2$

$y - 1 = 2(x - 3)$

$y - 1 = 2x - 6$

$+1 \quad +1$

$y = 2x - 5$

$-2x \quad -2x$

$-2x + y = -5$

$2x - y = 5$

4. $(-3, 12)$; $m = -2$

$y - 12 = -2(x + 3)$

$y - 12 = -2x - 6$

$+12 \quad +12$

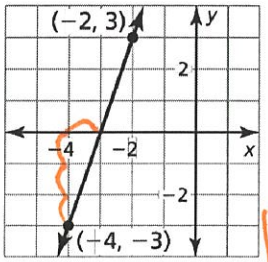
$y = -2x + 6$

$+2x \quad +2x$

$2x + y = 6$

In Exercises 5 and 6, write an equation in standard form of the line shown.

5.



$m = 3$

$y - 3 = 3(x + 2)$

$y - 3 = 3x + 6$

$+3 \quad +3$

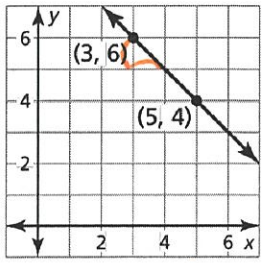
$y = 3x + 9$

$-3x \quad -3x$

$-3x + y = 9$

$3x - y = -9$

6.



$m = -1$

$y - 4 = -1(x - 5)$

$y - 4 = -x + 5$

$+4 \quad +4$

$y = -x + 9$

$+x \quad +x$

$x + y = 9$

In Exercises 7 and 8, write equations of the horizontal and vertical lines that pass through the given point.

7. $(1, 7)$

$y = 7$

$x = 1$

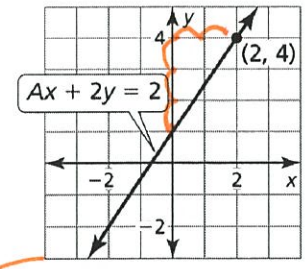
8. $(-9, -3)$

$y = -3$

$x = -9$

In Exercises 9 and 10, find the missing coefficient in the equation of the line shown. Write the completed equation.

9.



$A(2) + 2(4) = 2$

$2A + 8 = 2$

$-8 \quad -8$

$\frac{2A}{2} = \frac{-6}{2}$

$A = -3$

$m = \frac{3}{2}$

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

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

$+4 \quad +4$

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

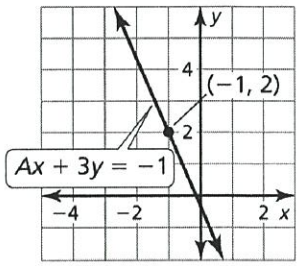
$-\frac{3}{2}x \quad -\frac{3}{2}x$

$2\left(-\frac{3}{2}x + y = 1\right)$

$-3x + 2y = 2$

$A = -3$

10.



$Ax + By = C$

$A(-1) + 3(2) = -1$

$-A + 6 = -1$

$-6 \quad -6$

$-A = -7$

$A = 7$

$7x + 3y = -1$