NAME _____ DATE _____ PERIOD _____

4-5 Graphing Linear Equations *(Pages 218–223)*

A **linear equation** may contain one or two variables with no variable having an exponent other than 1. A linear equation can be written in the form $Ax + By = C$, where A, B, and C are any real numbers, and A and B are not both zero. To graph a linear equation, find at least two solutions of the equation. Then, plot the points and draw a straight line through them.

Examples

a. Determine whether the equation $y = 2x - 1$ is a linear equation. If it is, rewrite the equation in the form $Ax + By = C$.

This is a linear equation, since the equation contains only two variables and the power on each variable is 1. First, rewrite the equation so that both variables are on the same side of the equation.

$y = 2x - 1$

$-2x + y = -1$ *Subtract 2x from each side.*

The equation is now in the form $Ax + By = C$, where $A = -2$, $B = 1$, and $C = -1$.

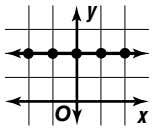
b. Graph the equation $y = 2$.

Select five values for the domain and make a table.

x	y	(x, y)
−2	2	(−2, 2)
−1	2	(−1, 2)
0	2	(0, 2)
1	2	(1, 2)
2	2	(2, 2)

Note that because the equation does not contain the variable x, x can be any value and the y value will still be 2.

Then graph the ordered pairs and connect them to draw the line. Note that the graph of $y = 2$ is a horizontal line through (0, 2).



Try These Together

1. Rewrite the equation $x = 3$ in the form $Ax + By = C$.

HINT: Since there is no variable y in this equation, use the placeholder 0y.

2. Graph the equation $3x - y = 5$.

HINT: To find values for y more easily, solve the equation for y. Subtract 3x from each side and then divide each side by −1.

Practice

Determine whether each equation is a linear equation. If an equation is linear, rewrite it in the form $Ax + By = C$.

3. $y = 2x^2 - 3$ **4.** $x = 2y + 8$ **5.** $y = -1$

6. $y = -4x + 1$ **7.** $3x = 5y + 7$ **8.** $8 - y = x$

Graph each equation.

9. $y = x + 4$ **10.** $y = 3x - 1$ **11.** $y = 3 - 2x$

12. $y - 3 = 0$ **13.** $y + 5 = 0$ **14.** $x - 2 = 0$

15. $x - y = 6$ **16.** $x + y = 15$ **17.** $2x + y = 4$

18. **Standardized Test Practice** Write the equation $y = 2x - 8$ in the standard form $Ax + By = C$.

A $y + 2x = -8$ **B** $y - 2x = -8$ **C** $-2x + y = -8$ **D** $2x + y = -8$

Answers: **1.** $1x + 0y = 3$ **2.** See Answer Key. **3.** no **4.** yes; $x - 2y = 8$ **5.** yes; $0x + y = -1$ **6.** yes; $4x + y = 1$ **7.** yes; $3x - 5y = 7$ **8.** yes; $x + y = 8$ **9–17.** See Answer Key. **18.** C