

Graphing Linear Equations (Pages 310–315)

Graphing Equations Using the x- and y-intercepts	To find the x-intercept, substitute 0 for y in the equation and solve for x. To find the y-intercept, substitute 0 for x in the equation and solve for y. The graph intersects the x-axis at (x, 0) and the y-axis at (0, y). Graph the ordered pairs. Then draw the line that passes through the points.
Graphing Equations Using the Slope and y-intercept	Write the equation in slope-intercept form, $y = mx + b$. Graph the point (0, b). Use the slope m to find another point by moving the distance of the change in y and then the distance of the change in x from that point.

EXAMPLE

Graph $-2x + 3y = 9$ by using the slope and y-intercept.

Write the equation in slope-intercept form.

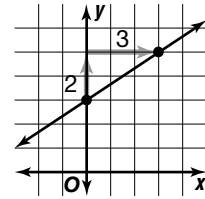
$$-2x + 3y = 9$$

$$3y = 2x + 9 \quad \text{Add } 2x \text{ to each side.}$$

$$y = \frac{2}{3}x + 3 \quad \text{Slope-intercept form}$$

y-intercept: 3 \Rightarrow (0, 3) is on the line.

slope of line: $\frac{2}{3}$ \Rightarrow Move up 2 units, then right 3 units from that point.



PRACTICE

Determine the x-intercept and y-intercept of the graph of each equation.

Then graph the equation.

1. $2x - y = 8$

2. $5x - y = 5$

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

4. $x - y = -1$

5. $x - 2y = 2$

6. $5x - y = 10$

7. $3x + 2y = 12$

8. $2x - y = 2$

9. $10x - 8y = 40$

Determine the slope and y-intercept of the graph of each equation. Then graph the equation.

10. $y = 3x - 2$

11. $y = 2$

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

13. $y = \frac{2}{5}x + 3$

14. $y = -\frac{5}{6}x + 4$

15. $y = \frac{1}{2}x - 8$

16. $x - 2y = -4$

17. $5y + 4 = -1$

18. $3x - 2y = 4$



19. **Standardized Test Practice** The y-intercept of the graph of a linear equation is 3. What additional information would allow you to graph the equation?

A x-intercept

B slope

C a second point on the line

D any of these

Answers: 1–18. See Answer Key for graphs. 1. 4, -8 2. 1, -5 3. -18, 8 4. -1, 1 5. 2, -1 6. 2, -10 7. 4, 6 8. 1, -2 9. 4, -5 10. $m = 3, b = -2$ 11. $m = 0, b = 2$ 12. $m = -\frac{4}{3}, b = -1$ 13. $m = \frac{5}{2}, b = 3$ 14. $m = -\frac{6}{5}, b = 4$ 15. $m = \frac{1}{2}, b = -8$ 16. $m = \frac{2}{5}, b = 3$ 17. $m = 0, b = -1$ 18. $m = \frac{2}{3}, b = -\frac{1}{3}$ 19. D