

Graphing Systems of Equations

(Pages 550–553)

A set of equations with the same variables forms a **system of equations**. A solution to a system of two or more equations is an ordered pair of numbers that satisfies all of the equations. One way to solve a system of equations is to carefully graph the equations on the same coordinate plane. The coordinates of the point at which the graphs intersect are the solution to the system.

EXAMPLE

Graph the system of equations to find the solution.

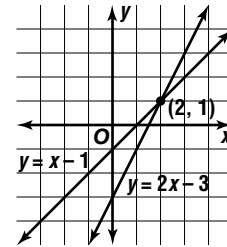
$$y = 2x - 3 \text{ and } y = x - 1$$

The graphs appear to intersect at the point with coordinates (2, 1).

Check this estimate by replacing x with 2 and y with 1 in each equation.

Check: $y = 2x - 3$	$y = x - 1$
$1 \stackrel{?}{=} 2(2) - 3$	$1 \stackrel{?}{=} 2 - 1$
$1 = 1 \checkmark$	$1 = 1 \checkmark$

The solution is (2, 1).



Try These Together

Solve each system of equations by graphing.

1. $y = x + 2$

$y = 2x - 1$

2. $y = 2x + 2$

$y = x - 1$

3. $y = 2x - 1$

$y = 3x - 3$

HINT: Be sure to check your solution by substituting the x - and y -values back into the two equations.

PRACTICE

Solve each system of equations by graphing.

4. $y = 9 - x$

$y = x + 1$

5. $2x + y = -5$

$3x + 3y = 9$

6. $y = 8 - x$

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

7. $y = -3$

$4x + y = 1$

8. $x + y = 2$

$x - y = 4$

9. $y = x + 2$

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

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

$y = 2x - 6$

11. $2x - 3y = -6$

$3x + y = 2$

12. $2x - y = 2$

$x - y = 3$



13. **Standardized Test Practice** Solve the system of equations.

$x - y = 2$

$x + y = 10$

A (3, 7)

B (7, 3)

C (4, 6)

D (6, 4)

Answers: 1–12. See Answer Key for graphs. 1. (3, 5) 2. (-3, -4) 3. (2, 3) 4. (4, 5) 5. (-8, 11) 6. (6, 2) 7. (1, -3) 8. (3, -1) 9. (-2, 0) 10. (2, -2) 11. (0, 2) 12. (-1, -4) 13. D