

6-1

Practice

Form K

Solving Systems by Graphing

Solve each system by graphing. Check your solution.

$$\begin{aligned} 1. \quad & y = x - 4 \\ & y = 3x - 4 \end{aligned} \quad (0, -4)$$

$$\begin{aligned} 2. \quad & y = -2x + 1 \\ & y = x - 2 \end{aligned} \quad (1, -1)$$

$$\begin{aligned} 3. \quad & y = -3x + 3 \\ & y = 2x - 7 \end{aligned} \quad (2, -3)$$

$$\begin{aligned} 4. \quad & y = x + 3 \\ & y = -4x - 2 \end{aligned} \quad (-1, 2)$$

$$\begin{aligned} 5. \quad & y = -3x + 2 \\ & y = 2x - 3 \end{aligned} \quad (1, -1)$$

$$\begin{aligned} 6. \quad & y = 4x - 11 \\ & y = -2x + 7 \end{aligned} \quad (3, 1)$$

7. **Reasoning** If the graphs of two linear equations in a system do not intersect each other, what does that tell you about the solution of the system? Explain.

If the lines are parallel and do not intersect, then there is no solution to the system of equations.

8. **Writing** Describe how to determine the solution of a system of two linear equations by graphing.

Graph both lines on the same coordinate plane to determine where they intersect. The point of intersection is the solution for the system of equations.

9. **Reasoning** Can you determine whether a system of two linear equations has one solution, an infinite number of solutions, or no solution by simply examining the equations without graphing the lines? Explain.

Yes, first solve for y to change the equations to slope-intercept form. If the equations can be simplified to be identical, the lines coincide resulting in an infinite number of solutions. If the slopes of the lines are the same but the y -intercepts are different, the lines are parallel resulting in no solutions. Otherwise, the lines intersect at one point resulting in one solution.

10. **Reasoning** Without graphing, decide whether the following system of linear equations has *one solution*, *infinitely many solutions*, or *no solution*. Explain.

$$8x = 2y - 16$$

$$y = 4x$$

The slopes of the lines are equal but the y -intercepts are not. Therefore, the lines are parallel and the system has no solution.

6-1

Practice (continued)

Form K

Solving Systems by Graphing

11. Right now Seth's age is $\frac{4}{5}$ the age of his brother Eric. Twenty-one years ago, Eric was twice as old as Seth. What are their ages now?

Eric = 35; Seth = 28

12. The sum of two numbers is 62, and their difference is 8. What are the numbers?

35, 27

13. One of the measures of the angles of a triangle is 25° . If the sum of the measures of the other two angles is 155° and the difference between their measures is 5° , what are the measures of the unknown angles?

80° and 75°

Solve each system by graphing. Tell whether the system has *one solution*, *infinitely many solutions*, or *no solution*.

14. $y = -5x + 1$
 $y = -3x - 1$

(1, -4); one solution

15. $y = 2x + 4$
 $y = \frac{1}{3}x - 1$

(-3, -2); one solution

16. $5x + y = -5$
 $10x + 2y - 10 = 0$

no solution

17. $y = 2x - 4$
 $y = \frac{3}{5}x + 3$

(5, 6); one solution

18. $3x - y = -2$
 $y = -\frac{1}{2}x + 9$

(2, 8); one solution

19. $y + 2x = 7$
 $2y - 1 = -4x + 13$

infinitely many solutions

20. **Writing** If two equations represent the same line, what can you conclude about the solution of the equations? Why? Explain.

If the lines coincide, there are an infinite number of solutions that satisfy the system of equations. The equations are identical which means any solution that satisfies one equation will satisfy the other equation.