5.3 Exercises

Check It Out
Help with Homework
BigIdeasMath.com

Vocabulary and Concept Check

1. **WRITING** Describe how to solve a system of linear equations by elimination.
2. **NUMBER SENSE** When should you use multiplication to solve a system of linear equations by elimination?
3. **WHICH ONE DOESN'T BELONG?** Which system of equations does *not* belong with the other three? Explain your reasoning.

$3x + 3y = 3$
$2x - 3y = 7$

$-2x + y = 6$
$2x - 3y = -10$

$2x + 3y = 11$
$3x - 2y = 10$

$x + y = 5$
$3x - y = 3$

Practice and Problem Solving

Use a method from Activity 1 to solve the system.

4. $x + y = 3$
   $x - y = 1$
5. $-x + 3y = 0$
   $x + 3y = 12$
6. $3x + 2y = 3$
   $3x - 2y = -9$

Solve the system of linear equations by elimination. Check your solution.

7. $x + 3y = 5$
   $-x - y = -3$
8. $x - 2y = -7$
   $3x + 2y = 3$
9. $4x + 3y = -5$
   $-x + 3y = -10$
10. $2x + 7y = 1$
    $2x - 4y = 12$
11. $2x + 5y = 16$
    $3x - 5y = -1$
12. $3x - 2y = 4$
    $6x - 2y = -2$

13. **ERROR ANALYSIS** Describe and correct the error in solving the system of linear equations.

✗

$5x + 2y = 9$ Equation 1
$3x - 2y = -1$ Equation 2
$2x = 10$
$x = 5$

The solution is $(5, -8)$.

14. **RAFFLE TICKETS** You and your friend are selling raffle tickets for a new laptop. You sell 14 more tickets than your friend sells. Together, you and your friend sell 58 tickets.
    a. Write a system of linear equations that represents this situation.
    b. How many tickets does each of you sell?

15. **JOGGING** You can jog around your block twice and the park once in 10 minutes. You can jog around your block twice and the park 3 times in 22 minutes.
    a. Write a system of linear equations that represents this situation.
    b. How long does it take you to jog around the park?

Solve the system of linear equations by elimination. Check your solution.

2 3 **16.** $2x - y = 0$
$3x - 2y = -3$

17. $x + 4y = 1$
$3x + 5y = 10$

18. $-2x + 3y = 7$
$5x + 8y = -2$

19. $3x + 3 = 3y$
$2x - 6y = 2$

20. $2x - 6 = 4y$
$7y = -3x + 9$

21. $5x = 4y + 8$
$3y = 3x - 3$

22. ERROR ANALYSIS Describe and correct the error in solving the system of linear equations.

$x + y = 1$ Equation 1
$5x + 3y = -3$ Equation 2

Multiply by -5.

$-5x + 5y = -5$
$5x + 3y = -3$
$8y = -8$
$y = -1$

The solution is $(2, -1)$.

23. REASONING For what values of a and b should you solve the system by elimination?

a. $4x - y = 3$
$ax + 10y = 6$

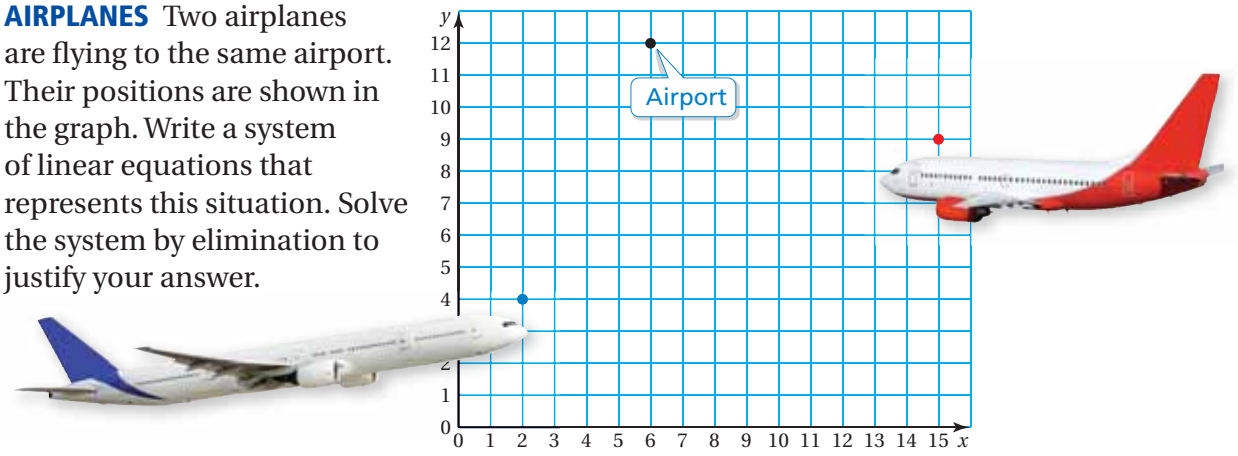
b. $x - 7y = 6$
$-6x + by = 9$

Determine whether the line through the first pair of points intersects the line through the second pair of points. Explain.

24. Line 1: $(-2, 1), (2, 7)$
Line 2: $(-4, -1), (0, 5)$

25. Line 1: $(3, -2), (7, -1)$
Line 2: $(5, 2), (6, -2)$

26. AIRPLANES Two airplanes are flying to the same airport. Their positions are shown in the graph. Write a system of linear equations that represents this situation. Solve the system by elimination to justify your answer.



27. TEST PRACTICE The table shows the number of correct answers on a practice standardized test. You score 86 points on the test, and your friend scores 76 points.

	You	Your Friend
Multiple Choice	23	28
Short Response	10	5

a. Write a system of linear equations that represents this situation.

b. How many points is each type of question worth?