

Practice 7-1

Solving Systems by Graphing

Solve by graphing. Write *no solution* or *infinitely many solutions* where appropriate.

- | | | | |
|---|--|---|---|
| 1. $y = 3x - 1$
$y = -2x + 4$ | 2. $y = x - 1$
$y = -x + 7$ | 3. $y = \frac{3}{4}x + 2$
$\frac{3}{4}x - y = 4$ | 4. $y = 4x + 7$
$y = -3x$ |
| 5. $y = x - 3$
$y = \frac{1}{7}x + 3$ | 6. $y = -3x - 4$
$3x + y = -4$ | 7. $y = -x - 3$
$y = -2x - 8$ | 8. $y = -x + 2$
$3x + 3y = 12$ |
| 9. $y = x$
$y = 3x + 2$ | 10. $y = 4x - 3$
$y = -3x - 3$ | 11. $y = \frac{5}{3}x - 4$
$y = 2x - 6$ | 12. $y = 3x + 2$
$2x + y = -8$ |
| 13. $x = y + 4$
$y = x + 4$ | 14. $x + y = 2$
$y = -2x - 1$ | 15. $2x - y = 3$
$y = x + 4$ | 16. $3x - 6y = 12$
$2x - 4y = 8$ |
| 17. $x - y = 1$
$y = \frac{3}{4}x + 1$ | 18. $y = x$
$x = 2y + 2$ | 19. $3x - y = 9$
$y = x + 1$ | 20. $2x + y = 0$
$y = 2x - 4$ |
| 21. $y = 2x - 6$
$x + y = 9$ | 22. $y = -x$
$y = 3x + 12$ | 23. $4x + y = 6$
$y = -4x - 1$ | 24. $y = 4x$
$y = -3x$ |
| 25. $y = x$
$2x + y = \frac{3}{2}$ | 26. $3x + y = 6$
$2x - y = \frac{3}{2}$ | 27. $x + 4y = -\frac{1}{2}$
$-2x - 3y = 1$ | 28. $x - y = -\frac{3}{2}$
$-2x + 5y = -4.5$ |

Solve each system by using a graphing calculator. Write *no solution* or *infinitely many solutions* where appropriate.

- | | | |
|---|--|---|
| 29. $y = x + 6$
$y = 2x - 7$ | 30. $y = \frac{7}{2}x - 6$
$y = 3x - 2$ | 31. $y = 2x - 20$
$y = -x + 34$ |
| 32. $y = \frac{2}{3}x + 4$
$2x - 3y = 3$ | 33. $y = -x - 5$
$y = 3x - 105$ | 34. $x + y = -10$
$2x + 3y = -30$ |
| 35. $3x - 4y = 0$
$2x + y = 110$ | 36. $y = \frac{1}{7}x + 10$
$x - 2y = 0$ | 37. $2x + y = 6$
$3y = -6x + 9$ |
| 38. $y = \frac{5}{6}x + 12$
$y = \frac{4}{3}x - 6$ | 39. $2x - y = 8$
$3x - 2y = 0$ | 40. $x + 2y = 2$
$3x + 4y = 22$ |
| 41. $y = 2x + 0.75$
$y = -4x - 8.25$ | 42. $1.25x + 3.25y = -5.75$
$0.5x - 1.5y = 0.5$ | 43. $x = -2y - 3.5$
$-5x + 3y = -15$ |

Practice 7-2**Solving Systems Using Substitution**

Solve each system using substitution. Write *no solution* or *infinitely many solutions* where appropriate.

1. $y = x$
 $y = -x + 2$

2. $y = x + 4$
 $y = 3x$

3. $y = 3x - 10$
 $y = 2x - 5$

4. $x = -2y + 1$
 $x = y - 5$

5. $y = 5x + 5$
 $y = 15x - 1$

6. $y = x - 3$
 $y = -3x + 25$

7. $y = x - 7$
 $2x + y = 8$

8. $y = 3x - 6$
 $-3x + y = -6$

9. $x + 2y = 200$
 $x = y + 50$

10. $3x + y = 10$
 $y = -3x + 4$

11. $y = 2x + 7$
 $y = 5x + 4$

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

13. $4x + 2y = 8$
 $y = -2x + 4$

14. $6x - 3y = 6$
 $y = 2x + 5$

15. $2x + 4y = -6$
 $x - 3y = 7$

16. $5x - 3y = -4$
 $x + y = -4$

17. $y = -\frac{2}{3}x + 4$
 $2x + 3y = -6$

18. $2x + 3y = 8$
 $\frac{3}{2}y = 4 - x$

19. $3x - y = 4$
 $2x + y = 16$

20. $x + y = 0$
 $x = y + 4$

21. $5x + 2y = 6$
 $y = -\frac{5}{2}x + 1$

22. $2x + 5y = -6$
 $4x + y = -12$

23. $4x + 3y = -3$
 $2x + y = -1$

24. $y = -\frac{2}{3}x + 1$
 $4x + 6y = 6$

25. $5x - 6y = 19$
 $4x + 3y = 10$

26. $2x + y = 6.6$
 $5x - 2y = 0.3$

27. $2x - 4y = 3.8$
 $3x - y = 17.7$

28. $3x + 4y = 8$
 $4.5x + 6y = 12$

29. $3x - 4y = -5$
 $x = y + 2$

30. $y = \frac{1}{3}x + 10$
 $x = 3y + 6$

31. $2x + 5y = 62$
 $3x - y = 23.3$

32. $-5x + y = 6$
 $2x - 3y = 60$

33. $x = \frac{3}{4}y - 6$
 $y = \frac{4}{3}x + 8$

34. $5x + 6y = -76$
 $x + 2y = -44$

35. $3x - 2y = 10$
 $y = \frac{3}{2}x - 1$

36. $-3x + 2y = -6$
 $-2x + y = 6$

37. At an ice cream parlor, ice cream cones cost \$1.10 and sundaes cost \$2.35. One day, the receipts for a total of 172 cones and sundaes were \$294.20. How many cones were sold?

38. You purchase 8 gal of paint and 3 brushes for \$152.50. The next day, you purchase 6 gal of paint and 2 brushes for \$113.00. How much does each gallon of paint and each brush cost?

Practice 7-3

Solving Systems Using Elimination

Solve by elimination. Show your work.

1. $x + 2y = 7$
 $3x - 2y = -3$
 2. $3x + y = 20$
 $x + y = 12$
 3. $5x + 7y = 77$
 $5x + 3y = 53$
 4. $2x + 5y = -1$
 $x + 2y = 0$
 5. $3x + 6y = 6$
 $2x - 3y = 4$
 6. $2x + y = 3$
 $-2x + y = 1$
 7. $9x - 3y = 24$
 $7x - 3y = 20$
 8. $2x + 7y = 5$
 $2x + 3y = 9$
 9. $x + y = 30$
 $x - y = 6$
 10. $4x - y = 6$
 $3x + 2y = 21$
 11. $x + 2y = 9$
 $3x + 2y = 7$
 12. $3x + 5y = 16$
 $x - 5y = -10$
 13. $2x - 3y = -11$
 $3x + 2y = 29$
 14. $8x - 9y = 19$
 $4x + y = -7$
 15. $2x + 6y = 0$
 $-2x - 5y = 0$
 16. $-2x + 3y = -9$
 $x + 3y = 3$
 17. $4x - 3y = 11$
 $3x - 5y = -11$
 18. $3x + 7y = 48$
 $5x - 7y = -32$
 19. $-2x + 3y = 25$
 $-2x + 6y = 58$
 20. $3x + 8y = 81$
 $5x - 6y = -39$
 21. $8x + 13y = 179$
 $2x - 13y = -69$
 22. $-x + 8y = -32$
 $3x - y = 27$
 23. $2x + 7y = -7$
 $5x + 7y = 14$
 24. $x + 6y = 48$
 $-x + y = 8$
 25. $6x + 3y = 0$
 $-3x + 3y = 9$
 26. $7x + 3y = 25$
 $-2x - y = -8$
 27. $3x - 8y = 32$
 $-x + 8y = -16$
 28. $4x - 7y = -15$
 $-4x - 3y = -15$
 29. $5x + 7y = -1$
 $4x - 2y = 22$
 30. $6x - 3y = 69$
 $7x - 3y = 76$
 31. $x + 8y = 28$
 $-3x + 5y = 3$
 32. $8x - 6y = -122$
 $-4x + 6y = 94$
 33. $2x + 9y = 36$
 $2x - y = 16$
 34. $-6x + 12y = 120$
 $5x - 6y = -48$
 35. $-x + 3y = 5$
 $-x - 3y = 1$
 36. $10x - 4y = 6$
 $10x + 3y = 13$
 37. $6x + 3y = 27$
 $-4x + 7y = 27$
 38. $6x - 8y = 40$
 $5x + 8y = 48$
 39. $3x + y = 27$
 $-3x + 4y = -42$
 40. $2x + 8y = -42$
 $-x + 8y = -63$
 41. $5x + 9y = 112$
 $3x - 2y = 8$
 42. $-3x + 2y = 0$
 $-3x + 5y = 9$
 43. $8x - 2y = 58$
 $6x - 2y = 40$
 44. $7x - 9y = -57$
 $-7x + 10y = 68$
 45. $9x + 3y = 2$
 $-9x - y = 0$
46. Shopping at Savers Mart, Lisa buys her children four shirts and three pairs of pants for \$85.50. She returns the next day and buys three shirts and five pairs of pants for \$115.00. What is the price of each shirt and each pair of pants?
47. Grandma's Bakery sells single-crust apple pies for \$6.99 and double-crust cherry pies for \$10.99. The total number of pies sold on a busy Friday was 36. If the amount collected for all the pies that day was \$331.64, how many of each type were sold?

Practice 7-4**Applications of Linear Systems**

Use a system of linear equations to solve each problem.

1. Your teacher is giving you a test worth 100 points containing 40 questions. There are two-point and four-point questions on the test. How many of each type of question are on the test?
2. Suppose you are starting an office-cleaning service. You have spent \$315 on equipment. To clean an office, you use \$4 worth of supplies. You charge \$25 per office. How many offices must you clean to break even?
3. The math club and the science club had fundraisers to buy supplies for a hospice. The math club spent \$135 buying six cases of juice and one case of bottled water. The science club spent \$110 buying four cases of juice and two cases of bottled water. How much did a case of juice cost? How much did a case of bottled water cost?
4. On a canoe trip, Rita paddled upstream (against the current) at an average speed of 2 mi/h relative to the riverbank. On the return trip downstream (with the current), her average speed was 3 mi/h. Find Rita's paddling speed in still water and the speed of the river's current.
5. Kay spends 250 min/wk exercising. Her ratio of time spent on aerobics to time spent on weight training is 3 to 2. How many minutes per week does she spend on aerobics? How many minutes per week does she spend on weight training?
6. Suppose you invest \$1500 in equipment to put pictures on T-shirts. You buy each T-shirt for \$3. After you have placed the picture on a shirt, you sell it for \$20. How many T-shirts must you sell to break even?
7. A light plane flew from its home base to an airport 255 miles away. With a head wind, the trip took 1.7 hours. The return trip with a tail wind took 1.5 hours. Find the average airspeed of the plane and the average windspeed.
8. Suppose you bought supplies for a party. Three rolls of streamers and 15 party hats cost \$30. Later, you bought 2 rolls of streamers and 4 party hats for \$11. How much did each roll of streamers cost? How much did each party hat cost?
9. A new parking lot has spaces for 450 cars. The ratio of spaces for full-sized cars to compact cars is 11 to 4. How many spaces are for full-sized cars? How many spaces are for compact cars?
10. While on vacation, Kevin went for a swim in a nearby lake. Swimming against the current, it took him 8 minutes to swim 200 meters. Swimming back to shore with the current took half as long. Find Kevin's average swimming speed and the speed of the lake's current.

Practice 7-5

Linear Inequalities

Graph each linear inequality.

- | | | |
|-------------------------------|-------------------------------|--------------------------------|
| 1. $y \geq -4$ | 2. $x + y < -2$ | 3. $y < x$ |
| 4. $x > 2$ | 5. $4x + y > -6$ | 6. $-3x + y \leq -3$ |
| 7. $x + 4y \leq 8$ | 8. $y > 2x + 6$ | 9. $y > -x + 2$ |
| 10. $2x + 3y < -9$ | 11. $y \leq \frac{3}{7}x + 2$ | 12. $4x + 2y < -8$ |
| 13. $y \leq \frac{3}{4}x + 1$ | 14. $x - y > 4$ | 15. $y \geq -\frac{2}{5}x - 2$ |

16. Suppose your class is raising money for the Red Cross. You make \$5 on each basket of fruit and \$3 on each box of cheese that you sell. How many items of each type must you sell to raise more than \$150?

- Write a linear inequality that describes the situation.
- Graph the inequality.
- Write two possible solutions to the problem.

17. Suppose you intend to spend no more than \$60 buying books. Hardback books cost \$12 and paperbacks cost \$5. How many books of each type can you buy?

- Write a linear inequality that describes the situation.
- Graph the inequality.
- Write two possible solutions to the problem.

18. Suppose that for your exercise program, you either walk 5 mi/d or ride your bicycle 10 mi/d. How many days will it take you to cover a distance of at least 150 mi?

- Write a linear inequality that describes the situation.
- Graph the inequality.
- Write two possible solutions to the problem.

Graph each linear inequality.

- | | | |
|-------------------------------|--------------------------------|--------------------------------|
| 19. $6x - 4y > -16$ | 20. $y \geq -\frac{1}{4}x - 3$ | 21. $-5x + 4y < -24$ |
| 22. $y < -5x + 6$ | 23. $6x - 4y < -12$ | 24. $y \geq -\frac{9}{5}x + 7$ |
| 25. $y > \frac{5}{7}x - 3$ | 26. $y < -5x + 9$ | 27. $-7x + 3y < -18$ |
| 28. $y \geq \frac{6}{5}x - 8$ | 29. $-12x + 8y < 56$ | 30. $16x + 6y > 36$ |

Practice 7-6**Systems of Linear Inequalities**

Solve each system by graphing. Show your work.

- | | | |
|---|---------------------------------------|---|
| 1. $y < 6$
$y > 3$ | 2. $x < 7$
$y > 2$ | 3. $x < 2$
$x > 5$ |
| 4. $x + y > -2$
$-x + y < 1$ | 5. $x + y < 2$
$x + y > 5$ | 6. $y < -5x + 6$
$y > 2x - 1$ |
| 7. $y < 2x - 3$
$-2x + y > 5$ | 8. $-x + 3y < 12$
$y \geq -x + 4$ | 9. $y \leq -\frac{1}{2}x + 3$
$y \geq -\frac{5}{3}x + 2$ |
| 10. $y \geq \frac{3}{4}x + 1$
$y \geq -\frac{2}{3}x - 1$ | 11. $6x + 4y > 12$
$-3x + 4y > 12$ | 12. $3x + y < 6$
$-2x + y < 6$ |
| 13. $-4x + 2y < -2$
$-2x + y > 3$ | 14. $-5x + y > -2$
$4x + y < 1$ | 15. $y < \frac{9}{5}x - 8$
$-9x + 5y > 25$ |
| 16. $5x + 4y < 1$
$8y \geq -10x + 24$ | 17. $6x + 8y < 32$
$-4x + 6y < 24$ | 18. $x + 7y < 14$
$x - 6y > -12$ |

19. In basketball you score 2 points for a field goal and 1 point for a free throw. Suppose that you have scored at least 3 points in every game this season, and have a season high score of 15 points in one game. How many field goals and free throws could you have made in any one game?

- Write a system of two inequalities that describes this situation.
 - Graph the system to show all possible solutions.
 - Write one possible solution to the problem.
20. Suppose you need to use at least \$1.00 worth of stamps to mail a package. You have as many \$.03 stamps as you need but only four \$.32 stamps. How many of each stamp can you use?
- Write a system of two inequalities that describes this situation.
 - Graph the system to show all possible solutions.
 - Write one possible solution to the problem.
21. A grandmother wants to spend at least \$40 but no more than \$60 on school clothes for her grandson. T-shirts sell for \$10 and pants sell for \$20. How many T-shirts and pants could she buy?
- Write a system of two inequalities that describes this situation.
 - Graph the system to show all possible solutions.
 - Write two possible solutions to the problem.