

EXERCISES

Practice and Problem Solving

For more practice, see *Extra Practice*.

A Practice by Example

Example 1
(page 340)

Is $(-1, 5)$ a solution of each system? Explain.

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

2. $y = -x + 4$
 $y = -\frac{1}{5}x$

3. $y = 5$
 $x = y - 6$

4. $y = 2x + 7$
 $y = x + 6$

Solve by graphing. Check your solution.

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

6. $y = x$
 $y = 5x$

7. $y = 1$
 $y = x$

8. $y = x + 4$
 $y = 4x + 1$

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

10. $y = \frac{1}{2}x + 1$
 $y = -3x + 8$

11. $3x + 4y = 12$
 $2x + 4y = 8$

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

Example 2
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13. Suppose you have \$20 in your bank account. You start saving \$5 each week. Your friend has \$5 in his account and is saving \$10 each week. Assume that neither you nor your friend makes any withdrawals.

- After how many weeks will you and your friend have the same amount of money in your accounts?
- How much money will each of you have?

14. Suppose you have \$55 in your bank account. You start saving \$10 each week. Your friend has \$20 in her account and is saving \$15 each week. When will you and your friend have the same amount of money in your accounts?

Examples 3, 4
(page 342)

Graph each system. Tell whether the system has *no solution* or *infinitely many solutions*.

15. $y = -2x + 1$
 $y = -2x - 3$

16. $x + 2y = 10$
 $2x + 4y = 10$

17. $y = 3x + 4$
 $-12x + 4y = 16$

18. $y = 2x + 6$
 $4x - 2y = 8$

B Apply Your Skills

Without graphing, decide whether each system has *one solution*, *no solution*, or *infinitely many solutions*. Explain.

19. $y = 2x$
 $y = 2x - 5$

20. $x + y = 4$
 $2x + 2y = 8$

21. $y = -3x + 1$
 $y = 3x + 7$

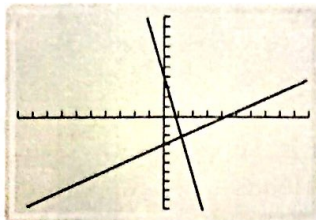
22. $3x - 5y = 0$
 $y = \frac{3}{5}x$



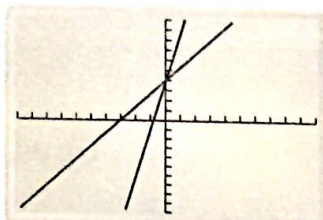
23. Which graphing calculator screen shows the solution of the system below?

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

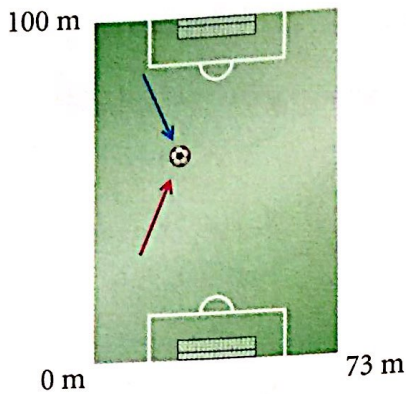
A.



B.



24. **Communications** A communications company offers a variety of calling card options. Card A has a 30¢ connection fee and then costs 2¢ per minute. Card B has a 10¢ connection fee and then costs 6¢ per minute. Find the length of the call that would cost the same with both cards.



25. **Soccer** Jim and Tony are on opposing teams in a soccer match. They are running after the same ball. Jim's path is the line $y = 3x$. Tony's path is the line $y = -2x + 100$. Solve by graphing to find the coordinates of the ball.

Open-Ended Write a system of two linear equations with the given characteristics.

26. One solution; perpendicular lines
 27. No solution; one equation is $y = 2x + 5$.
 28. Infinitely many solutions; one equation has a y -intercept of 3.

Solve by graphing. Check your solution.

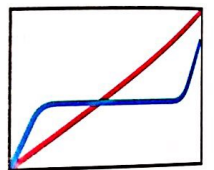
29. $y = 4x + 12$
 $y = -2x + 24$
30. $y = 3x - 5$
 $y = 2x + 10$
31. $y = x + 18$
 $y = -\frac{1}{2}x + 36$
32. $y = 4x + 80$
 $y = \frac{1}{2}x + 10$

33. Below is a retelling of one of Aesop's fables. Read it and use the story to answer the questions below.

One day, the tortoise challenged the hare to a race. The hare laughed while bragging about how fast a runner he was. On the day of the race, the hare was so confident that he took a nap during the race. When he awoke, he ran as hard as he could, but he could not beat the slow-but-sure tortoise across the finish line.



- a. The graph at the right shows the race of the tortoise and the hare. Which label should be on each axis?
- b. **Writing** Which color indicates the tortoise? Which indicates the hare? Explain your answers.
- c. What does the point of intersection mean?



Graphing Calculator Find the solution of each system. If necessary, round answers to the nearest tenth.

34. $y = 1.5x + 2$
 $y = 2.5x + 14$
35. $y = -\frac{7}{3}x + \frac{16}{3}$
 $y = \frac{4}{3}x + \frac{38}{3}$
36. $y = 0.2x + 3.5$
 $y = 0.4x + 9.5$
37. $y = 3.2x + 4.5$
 $y = -8.7x - 6.1$

38. Use the spreadsheet to find the solution of the following system.

$$y = -4x + 11$$

$$y = 3x - 3$$

39. **Recording Music** Suppose you and your friends form a band. You want to record a demo. Studio A rents for \$100 plus \$50/hour. Studio B rents for \$50 plus \$75/hour.

	A	B	C
1	x	$y = -4x + 11$	$y = 3x - 3$
2	-1	15	-6
3	0	11	-3
4	1	7	0
5	2	3	3
6	3	-1	6

- a. Solve the system by graphing.
 b. Explain what the solution of the system means in terms of renting a studio.