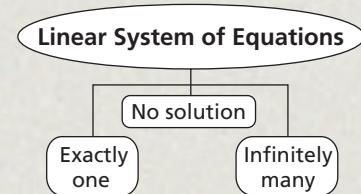


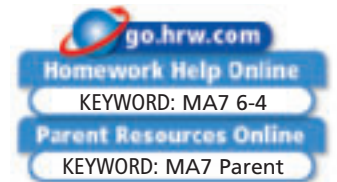
## THINK AND DISCUSS

- Describe the graph of a system of equations that has infinitely many solutions. Compare the slopes and  $y$ -intercepts.
- What methods can be used to determine the number of solutions of a system of linear equations?
- GET ORGANIZED** Copy and complete the graphic organizer. In each box, write the word that describes a system with that number of solutions and sketch a graph.



## 6-4

## Exercises



### GUIDED PRACTICE

- Vocabulary** A \_\_\_\_\_? \_\_\_\_\_ system can be independent or dependent. (*consistent* or *inconsistent*)

Solve each system of linear equations.

SEE EXAMPLE 1  
p. 406

$$2. \begin{cases} y = x + 1 \\ -x + y = 3 \end{cases}$$

$$3. \begin{cases} 3x + y = 6 \\ y = -3x + 2 \end{cases}$$

$$4. \begin{cases} -y = 4x + 1 \\ 4x + y = 2 \end{cases}$$

SEE EXAMPLE 2  
p. 407

$$5. \begin{cases} y = -x + 3 \\ x + y - 3 = 0 \end{cases}$$

$$6. \begin{cases} y = 2x - 4 \\ 2x - y - 4 = 0 \end{cases}$$

$$7. \begin{cases} -7x + y = -2 \\ 7x - y = 2 \end{cases}$$

SEE EXAMPLE 3  
p. 408

Classify each system. Give the number of solutions.

$$8. \begin{cases} y = 2(x + 3) \\ -2y = 2x + 6 \end{cases}$$

$$9. \begin{cases} y = -3x - 1 \\ 3x + y = 1 \end{cases}$$

$$10. \begin{cases} 9y = 3x + 18 \\ \frac{1}{3}x - y = -2 \end{cases}$$

SEE EXAMPLE 4  
p. 408

- Athletics** Micah walks on a treadmill at 4 miles per hour. He has walked 2 miles when Luke starts running at 6 miles per hour on the treadmill next to him. If their rates continue, will Luke's distance ever equal Micah's distance? Explain.

### PRACTICE AND PROBLEM SOLVING

Solve each system of linear equations.

$$12. \begin{cases} y = 2x - 2 \\ -2x + y = 1 \end{cases}$$

$$13. \begin{cases} x + y = 3 \\ y = -x - 1 \end{cases}$$

$$14. \begin{cases} x + 2y = -4 \\ y = -\frac{1}{2}x - 4 \end{cases}$$

$$15. \begin{cases} -6 + y = 2x \\ y = 2x - 36 \end{cases}$$

$$16. \begin{cases} y = -2x + 3 \\ 2x + y - 3 = 0 \end{cases}$$

$$17. \begin{cases} y = x - 2 \\ x - y - 2 = 0 \end{cases}$$

$$18. \begin{cases} x + y = -4 \\ y = -x - 4 \end{cases}$$

$$19. \begin{cases} -9x - 3y = -18 \\ 3x + y = 6 \end{cases}$$

**Independent Practice**

For Exercises	See Example
12–15	1
16–19	2
20–22	3
23	4

**Extra Practice**

Skills Practice p. S15  
Application Practice p. S33



**Geology**



Geodes are rounded, hollow rock formations. Most are partially or completely filled with layers of colored quartz crystals. The world's largest geode was discovered in Spain in 2000. It is 26 feet long and 5.6 feet high.

Classify each system. Give the number of solutions.

20.  $\begin{cases} y = -x + 5 \\ x + y = 5 \end{cases}$

21.  $\begin{cases} y = -3x + 2 \\ y = 3x \end{cases}$

22.  $\begin{cases} y - 1 = 2x \\ y = 2x - 1 \end{cases}$

23. **Sports** Mandy is skating at 5 miles per hour. Nikki is skating at 6 miles per hour and started 1 mile behind Mandy. If their rates stay the same, will Mandy catch up with Nikki? Explain.

24. **Multi-Step** Photocopier A can print 35 copies per minute. Photocopier B can print 35 copies per minute. Copier B is started and makes 10 copies. Copier A is then started. If the copiers continue, will the number of copies from machine A ever equal the number of copies from machine B? Explain.

25. **Entertainment** One week Trey rented 4 DVDs and 2 video games for \$18. The next week he rented 2 DVDs and 1 video game for \$9. Find the rental costs for each video game and DVD. Explain your answer.

26. Rosa bought 1 pound of cashews and 2 pounds of peanuts for \$10. At the same store, Sabrina bought 2 pounds of cashews and 1 pound of peanuts for \$11. Find the cost per pound for cashews and peanuts.

27. **Geology** Pam and Tommy collect geodes. Pam's parents gave her 2 geodes to start her collection, and she buys 4 every year. Tommy has 2 geodes that were given to him for his birthday. He buys 4 every year. If Pam and Tommy continue to buy the same amount of geodes per year, when will Tommy have as many geodes as Pam? Explain your answer.

28. Use the data given in the tables.

x	3	4	5	6
y	6	8	10	12

x	12	13	14	15
y	24	26	28	30

- Write an equation to describe the data in each table.
  - Graph the system of equations from part a. Describe the graph.
  - How could you have predicted the graph by looking at the equations?
  - What if...?** Each y-value in the second table increases by 1. How does this affect the graphs of the two equations? How can you tell how the graphs would be affected without actually graphing?
29. **Critical Thinking** Describe the graphs of two equations if the result of solving the system by substitution or elimination is the statement  $1 = 3$ .

**MULTI-STEP TEST PREP**



30. This problem will prepare you for the Multi-Step Test Prep on page 412.

The Crusader pep club is selling team buttons that support the sports teams. They contacted Buttons, Etc. which charges \$50 plus \$1.10 per button, and Logos, which charges \$40 plus \$1.10 per button.

- Write an equation for each company's cost.
- Use the system from part a to find when the price for both companies is the same. Explain.
- What part of the equation should the pep club negotiate to change so that the cost of Buttons, Etc. is the same as Logos? What part of the equation should change in order to get a better price?