

Chapter 7 Review

1. Decide if the ordered pair $(-4, -1)$ is a solution of the system of linear equations

$$-5x + y = 19$$

$$x - 7y = 3$$

2. Use a graph to solve the system of linear equations. Check your solutions algebraically.

$$x + y = 3$$

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

3. Graph and check to solve the linear system.

$$y = 2x - 4$$

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

4. Graph and check to solve the linear system.

$$\frac{1}{5}x + \frac{3}{5}y = \frac{12}{5}$$

$$-\frac{1}{5}x + \frac{3}{5}y = \frac{6}{5}$$

5. A fitness club offers two water aerobics classes. There are currently 40 people regularly going to the morning class, and attendance is increasing at a rate of 2 people per month. There are currently 22 people regularly going to the evening class, and the attendance is increasing at a rate of 8 people per month. Predict when the number of people in each class will be the same.

6. Use the substitution method to solve the linear system.

$$2c - d = -2$$

$$4c + d = 5$$

7. Use the substitution method to solve the linear system.

$$m + 2n = 1$$

$$5m + 3n = -23$$

8. Use the substitution method to solve the linear system.

$$\frac{1}{8}p + \frac{3}{4}q = 7$$

$$\frac{3}{2}p - q = 4$$

9. Use the substitution method to solve the linear system. Then use a graphing calculator to check your solution.

$$x + y = 20$$

$$\frac{1}{5}x + \frac{1}{2}y = 8$$

10. Your math teacher tells you that next week's test is worth 100 points and contains 38 problems. Each problem is worth either 5 points or 2 points. Because you are studying systems of linear equations, your teacher says that for extra credit you can figure out how many problems of each value are on the test. How many of each value are there?

11. Use linear combinations to solve the system of linear equations.

$$3v - 2w = 1$$

$$2v + 2w = 4$$

12. Use linear combinations to solve the system of linear equations.

$$2g - 3h = 0$$

$$3g - 2h = 5$$

13. Use linear combinations to solve the system of linear equations.

$$10m + 16n = 140$$

$$5m - 8n = 60$$

14. Use linear combinations to solve the system of linear equations.

$$3b + 2c = 46$$

$$5c + b = 11$$

15. Use linear combinations to solve the system of linear equations.

$$1.5v - 6.5w = 3.5$$

$$0.5v + 2w = -3$$

16. A farmer is tracking two wild honey bees in his field. He maps the first bee's path back to the hive on the line $y = \frac{9}{7}x$. The second bee's path follows the line $y = -3x + 12$. Their paths cross at the hive. At what coordinates will the farmer find the hive?

17. Choose a method to solve the linear system and then solve the system.

$$2x - y = 3$$

$$4x + 3y = 21$$

18. Choose a method to solve the linear system and then solve the system.

$$x + y = 0$$

$$3x + 2y = 1$$

19. Choose a method to solve the linear system and then solve the system.

$$0.2x - 0.5y = -3.8$$

$$0.3x + 0.4y = 10.4$$

20. You plant a 14-inch hemlock tree in your backyard that grows at a rate of 4 inches per year and an 8-inch blue spruce tree that grows at a rate of 6 inches per year. In how many years after you plant the trees will the two trees be the same height? How tall will each tree be?

21. You exercised on a treadmill for 1.5 hours. You ran at 4 miles per hour, then you sprinted at 6 miles per hour. If the treadmill monitor says that you ran and sprinted 7 miles, how long did you run at each speed?

22. Use the substitution method or linear combinations to solve the linear system and tell how many solutions the system has.

$$4x + 4y = -8$$

$$2x + 2y = -4$$

23. Use the substitution method or linear combinations to solve the linear system and tell how many solutions the system has.

$$2x + y = -1$$

$$-6x - 3y = -15$$

24. A carpenter is buying supplies for a job. The carpenter needs 4 sheets of oak paneling and 2 sheets of shower tileboard. The carpenter pays \$99.62 for these supplies. For the next job the carpenter buys 12 sheets of oak paneling and 6 sheets of shower tileboard and pays \$298.86.

- Could you find how much the carpenter is spending on 1 sheet of oak paneling? Explain.
- If the carpenter later spends a total of \$139.69 for 1 sheet of tileboard and 8 sheets of oak paneling, could you find out how much 1 sheet of oak paneling costs? Explain.

25. Graph the system of linear inequalities.

$$2x + y > 2$$

$$6x + 3y < 12$$

26. Graph the system of linear inequalities.

$$x - 3y \geq 12$$

$$x - 6y \leq 12$$

27. Graph the system of linear inequalities.

$$2x + y \geq 2$$

$$x \leq 3$$

$$y \leq \frac{1}{2}$$

28. Use a graphing calculator to graph the system of linear inequalities. Give the coordinates of each vertex of the solution region.

$$x + 2y \geq 0$$

$$5x - 2y \leq 0$$

$$-x + y \leq 3$$

29. Suppose you can work a total of no more than 20 hours per week at your two jobs. Baby-sitting pays \$5 per hour and your cashier job pays \$6 per hour. You need to earn at least \$90 per week to cover your expenses.
- Write a system of inequalities that shows the various numbers of hours you can work at each job. Graph the result.
 - Give two possible ways you could divide your hours between the two jobs.