

# Chapter Test

# Form A

## Chapter 3

1. Classify the system  $\begin{cases} x - 5 = -y \\ 2y - 10 = -2x \end{cases}$  without graphing.

**Solve each system.**

2.  $\begin{cases} y = 2x + 8 \\ y = 3x - 1 \end{cases}$

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

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

5. **Writing** List the three methods used to solve systems of equations. Choose two, and describe the strengths of those methods.

**Graph each system.**

6.  $\begin{cases} y > x - 5 \\ 3x + y \leq -2 \end{cases}$

7.  $\begin{cases} y \leq x + 2 \\ y > |x - 3| + 1 \end{cases}$

**Graph each system of constraints. Find all vertices. Evaluate the objective function at each vertex to find the maximum or minimum value.**

8.  $\begin{cases} x \leq 3 \\ y \leq 7 \\ x \geq 0, y \geq 0 \end{cases}$

9.  $\begin{cases} 2x + y \leq 30 \\ x + y \leq 20 \\ x \geq 0, y \geq 0 \end{cases}$

Maximum for  $P = 2x + 3y$

Minimum for  $C = x + 4y$

10. Jerome burns 4 cal/min walking and 10 cal/min running. He walks between 10 and 20 min each day and runs between 30 and 45 min each day. He never spends more than an hour running and walking together. How much time should he spend on each activity to maximize the number of calories he burns?

11. **Open-Ended** Write a system of restrictions that forms a trapezoid.

**Graph each point.**

12. (0, 4, 0)

13. (-4, 0, 0)

14. (2, 0, 5)

15. (3, 0, -2)

16. (4, 1, -1)

17. (3, -3, 1)

**Graph each equation. Use intercepts and traces.**

18.  $x + 2y + z = 4$

19.  $6x - 2y - 3z = -12$

20.  $-5x + 2y - z = 10$

21. **Open-Ended** Suppose you are writing a test for a friend whom you tutor. You want it to total 100 points. Multiple-choice questions count 1 point, fill-in-the-blank questions count 2 points, and short-answer questions count 5 points. What are the possible combinations for types of test questions? Write and graph an equation for the number of each that you can use.

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## Chapter Test (continued)

## Form A

## Chapter 3

Solve each system of equations.

22. 
$$\begin{cases} 5x + 4y - z = 1 \\ 2x - 2y + z = 1 \\ -x - y + z = 2 \end{cases}$$

23. 
$$\begin{cases} x + y + z = 0 \\ 2x + 3y + 2z = -1 \\ x - y + z = 2 \end{cases}$$

24. 
$$\begin{cases} x + 2y = 0 \\ 4x - z = 4 \\ 5y + z = -1 \end{cases}$$

25. **Writing** In a system of three linear equations with three variables, the number of solutions depends on how the planes defined by the equations intersect. List the different numbers of solutions that are possible, and explain when each occurs.

Solve each problem.

26. Jennifer has ten fewer quarters than dimes and five fewer nickels than quarters. The total value of the coins is \$4.75. How many quarters, nickels, and dimes does she have?
27. Fix-It-Fast Plumbing charges \$25 for a house call and \$50 for each hour spent on the job. Do-It-Right Plumbing charges \$35 for a house call and \$45 for each hour spend on the job. How many hours must be spent on the job in order for the charges of the two plumbing companies to be equal?
28. Which point gives the minimum value for  $P = 3x + 2y$  and lies within the system of restrictions?

$$\begin{cases} 1 \leq x \leq 6 \\ 2 \leq y \leq 5 \\ x + y \leq 10 \end{cases}$$

A. (1, 2)

B. (0, 0)

C. (5, 5)

D. (1, 5)