

Chapter Test

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7. Substitution is used when an equation is easily solved for one of the variables.



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Classify each system without graphing. Then graph each system. 1-2. See back of book.

1.
$$\begin{cases} y = 5x - 2 \\ y = x + 4 \end{cases}$$
2.
$$\begin{cases} 3x + 2y = 9 \\ 3x + 2y = 4 \end{cases}$$

Solve using substitution.

(3, 8)

3.
$$\begin{cases} 3x + 2y = 9 \\ x + y = 4 \\ (1, 3) \end{cases}$$
4.
$$\begin{cases} 0.3x - y = 0 \\ y = 2 + 0.25x \\ (40, 12) \end{cases}$$
Solve using elimination.

5.
$$\begin{cases} 3x - y = 1 \\ 2x + y = 14 \end{cases}$$
 6.

6.
$$\begin{cases} 4x - 2y = 3\\ 2y - 4x = \frac{3}{2} \end{cases}$$
no solution

7. Writing Describe how to identify situations in which substitution may be the best method for solving a system of equations. See margin.

Graph each system. 8–11. See back of book.

8.
$$\begin{cases} 2x + y < 3 \\ x < y + 3 \end{cases}$$
9.
$$\begin{cases} 3y + 9x < 3 \\ y \ge 2 \end{cases}$$
10.
$$\begin{cases} |x + 3| > y \\ y > 2x - 1 \end{cases}$$
11.
$$\begin{cases} y > -2x + 6 \\ y \le \frac{1}{4}x - 3 \end{cases}$$

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

12. $\begin{cases} x \le 5 \\ y \le 4 \\ x \ge 0, y \ge 0 \end{cases}$	13. $\begin{cases} x + y \le 8 \\ x + 2y \ge 6 \\ x \ge 0, y \ge 0 \end{cases}$
Maximum for $P = 2x + y$	$\begin{array}{l} \text{Minimum for} \\ C = x + 3y \end{array}$
12–13. See back of book.	

- **14. Sales** A pizza shop makes \$1.50 on each small pizza and \$2.15 on each large pizza. On a typical Friday, it sells between 70 and 90 small pizzas and between 100 and 140 large pizzas. The shop can make no more than 210 pizzas in a day. How many of each size of pizza must be sold in order to maximize profit? 70 small, 140 large
 - **15. Open-Ended** Write a system of constraints whose graph is a parallelogram. Check students' work.

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Graph each point in coordinate space.

l6. (0, 5, 0)	17. (-1, 0, 0)	18. (1, 0, 4)			
19. (3, 0, −1)	20. (1, 4, -1)	21. (2, -2, 3)			
16–21. See margin pp. 164–165.					

Graph each equation. Use intercepts and traces.

22.
$$x + y + z = 6$$

23. $2x - 3y + z = 6$
24. $-2x + y - 5z = 10$
25. $x - y + 2z = 8$
27. $2x - 3y + z = 6$

·26. See back of book.

26. You are planning a party. You have \$24 to spend on decorations. Balloons cost \$.06 each, party favors cost \$.48 each, and streamers cost \$.08 each. Write and graph an equation for the number of each you can buy.

Solve each system of equations.

$$27. \begin{cases} x - y + z = 0 \\ 3x - 2y + 6z = 9 \\ -x + y - 2z = -2 \end{cases} \\ (1, 3, 2) \\ 2x + y + z = 8 \\ 2x + y + z = 8 \\ x + 2y - z = -5 \\ z = 2x - y \\ (2, -1, 5) \end{cases}$$

Write a system of equations to solve each problem.

- **29.** Investing A company invested \$50,000 in three funds. After a year it had \$54,500. The growth fund had a return rate of 12%, the income fund had a return rate of 8%, and the money market fund had a return rate of 5%. The company invested twice as much in the income fund as in the money market fund. How much did the company invest in each fund? 29-31. See back of book.
- **30. Earnings** A student can make a weekly salary of \$200 plus 15% commission on sales at the Radio Barn or a weekly salary of \$300 plus 10% commission on sales at Woofer, Etc. For what amount of sales do these two jobs pay the same?
- **31.** Purchasing To help passengers stranded by bad weather one winter, an airport made the purchases detailed below. Find the cost of a cot, a table, and a chair.

	Number of Cots	Number of Tables	Number of Chairs	Total Costs (\$)
Nov	10	10	40	1950
Dec	20	0	20	1800
Jan	10	5	20	1350