LESSON 3.6

NAME _____ DATE _____

Practice A

For use with pages 177–184

Decide whether the given ordered triple is a solution of the system.

1. $(1, 1, 1)$

$x + y + z = 3$

$2x - y + 4z = 5$

$x + 4y - 2z = 3$

2. $(0, 3, 1)$

$x + 2y + z = 7$

$4x - y + 3z = 0$

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

3. $(2, 1, 6)$

$x + y - z = -3$

$2x - y + z = 9$

$4x + y - z = 15$

Solve the system using the substitution method.

4. $x - 2y + 3z = -4$

$y - z = 3$

$z = -1$

5. $x + 3y = 1$

$y + 2z = 5$

$z = 3$

6. $x + 5y - 7z = 6$

$y - 3z = 7$

$z = -4$

7. $x + 2y + z = 1$

$y - z = 2$

$4z = 8$

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

$y + 4z = 2$

$2y = 4$

9. $x + 2y - z = 3$

$x + 2y = 5$

$x = -1$

Solve the system using the linear combination method.

10. $x + y + z = 5$

$2x - y + z = 4$

$3x - y + 2z = 8$

11. $x + 2y - 3z = -8$

$2x + y + 3z = 17$

$x - 3y + 3z = 11$

12. $2x + y - z = -7$

$-2x - y + 3z = 17$

$2x + 3y - 2z = -12$

13. $x + 2y - 4z = 2$

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

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

14. $2x + 3y - z = 4$

$4x + 6y - 2z = 6$

$-2x + y + z = -2$

15. $x + y + z = 6$

$x + y - z = 0$

$x - y + z = 4$

Pool Admission **In Exercises 16 and 17, use the following information.**

A public swimming pool has the following rates: ages under 5 are free, ages 5–16 are \$3, and ages 16 and up are \$4. The pool also has a policy that every child under age 5 must be accompanied by an adult. The families in your neighborhood decide to go to the pool as part of a summer party. There are 22 people in your group and an equal number of children under age 5 as people 16 years old and older. The total admission cost was \$54. Use the model below.

[Number of people under age 5] + [Number of people ages 5–16] + [Number of people ages 16 and up] = [Total number of people]

[Rate for under age 5] · [Number of people under age 5] + [Rate for ages 5–16] · [Number of people ages 5–16] + [Rate for ages 16 and over] · [Number of people ages 16 and over] = [Total cost]

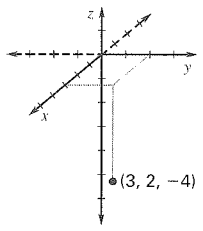
[Number of people under age 5] = [Number of people ages 16 and over]

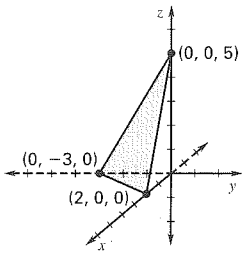
16. Write a system of linear equations in three variables to find the number of people in each age category in your group.

17. How many people in your group are in the different age categories designated by the pool?

Lesson 3.6 *continued*

Daily Homework Quiz

1. 

2. 

3. $f(x, y) = -4x + \frac{5}{2}y + \frac{9}{2}, \frac{47}{2}$

Lesson Opener

Allow 10 minutes.

Sample answers: Order of answers does not matter. **1.** All 3 planes intersect in a single point; exactly one solution. **2.** All 3 planes intersect in a line; infinitely many solutions on line. **3.** The planes intersect pairwise, but all 3 have no point in common; no solution.

4. All 3 planes are parallel; no solution.

5. Two planes are parallel and the third intersects both; no solution. **6.** The planes coincide; infinitely many solutions in the plane.

Practice A

1. $(1, 1, 1)$ is a solution. **2.** $(0, 3, 1)$ is a solution. **3.** $(2, 1, 6)$ is *not* a solution.

4. $(3, 2, -1)$ **5.** $(4, -1, 3)$ **6.** $(3, -5, -4)$

7. $(-9, 4, 2)$ **8.** $(2, 2, 0)$ **9.** $(-1, 3, 2)$

10. $(1, 1, 3)$ **11.** $(2, 1, 4)$ **12.** $(-1, 0, 5)$

13. infinitely many solutions **14.** no solutions

15. $(2, 1, 3)$ **16.** $x + y + z = 22$
$3y + 4z = 54$
$x = z$

17. Six are under age 5, 10 are ages 5–16, and 6 are ages 16 and up.

Practice B

1. $(0, 0, 3)$ is a solution.

2. $(-1, -2, 5)$ is a solution.

3. $(0, 0, 0)$ is *not* a solution.

4. $(-1, -3, -2)$ is a solution.

5. $(5, 7, 1)$ is *not* a solution.

6. $(-4, 8, -9)$ is *not* a solution.

7. $(-2, -8, -1)$ **8.** $(3, 5, 2)$ **9.** $(1, 0, -2)$

10. $(2, -3, 5)$ **11.** $(1, 1, -2)$ **12.** $(-6, 5, 3)$

13. $(-3, 2, 5)$ **14.** $(0, -2, 3)$

15. infinitely many solutions

16. $0.6x + 0.5y + 0.5z = 1770$
$0.25x + 0.35y + 0.45z = 1165$
$0.15x + 0.15y + 0.05z = 365$

There were 1200 pounds of pet food in the first shipment, 800 pounds of pet food in the second shipment, and 1300 pounds of pet food in the third shipment.

17. $0.55x + 0.65y + 0.60z = 3405$
$0.25x + 0.10y + 0.20z = 1070$
$0.20x + 0.25y + 0.20z = 1225$

There are 2000 comedies, 1700 dramas, and 2000 action movies at the store.

Practice C

1. $(5, 2, -6)$ **2.** $\left(\frac{1}{2}, -1, -\frac{3}{2}\right)$ **3.** no solution

4. $(1, -4, -2)$ **5.** $(1, 1, 1)$

6. All points of the form $\left(-\frac{4}{13}z + \frac{34}{13}, \frac{7}{13}z - \frac{14}{13}, z\right)$

7. $\left(\frac{1}{2}, 0, 2\right)$ **8.** $\left(\frac{1}{3}, \frac{2}{3}, -\frac{1}{3}\right)$ **9.** $\left(-\frac{5}{76}, -\frac{3}{38}, \frac{49}{76}\right)$

10. $\left(-\frac{1}{2}, \frac{2}{3}, 1\right)$ **11.** $\left(\frac{5}{3}, -\frac{1}{3}, \frac{1}{4}\right)$

12. All points of the form $(-z, z + 2, z)$

13. $\left(7, -8, \frac{17}{4}, -\frac{9}{4}\right)$ **14.** $(2, -1, 3, 2)$

15. $a - b + c = -3$ **16.** $4a + 2b + c = 12$

17. $a + b + c = 3, a - b + c = -3,$
$4a + 2b + c = 12, a = 2, b = 3, c = -2$

18. $y = 2x^2 + 3x - 2$

Reteaching with Practice

1. $(-2, 4, 5)$ **2.** $(2, 3, -1)$ **3.** $(1, 2, 3)$

4. $(2z, -z, z)$ **5.** no solution **6.** no solution

7. $(4 + 3z, 5 + 2z, z)$

Real-Life Application

1. Let x = three-point shots, y = two-point baskets, z = one point shots $x + y + z = 7$

2. $3x + 2y + z = 14$ **3.** $x = z$

4. $x = 2, y = 3, z = 2$ **5.** *Sample answer:* Possibly. Knowing who made the three-point shots and using those players as starters might get the team ahead with identifying the high scoring