

LESSON

3-6

Practice B**Solving Linear Systems in Three Variables**

Use elimination to solve each system of equations.

1.
$$\begin{cases} x + y - 2z = 10 \\ 8x - 9y - z = 5 \\ 3x + 4y + 2z = -10 \end{cases}$$

2.
$$\begin{cases} 6x + 3y + 4z = 3 \\ x + 2y + z = 3 \\ 2x - y + 2z = 1 \end{cases}$$

3.
$$\begin{cases} x + y + z = 0 \\ x - y + z = 14 \\ x - y - z = 16 \end{cases}$$

4.
$$\begin{cases} 8x + 3y - 6z = 4 \\ x - 2y - z = 2 \\ 4x + y - 2z = -4 \end{cases}$$

5.
$$\begin{cases} 2x - y - z = 1 \\ 3x + 2y + 2z = 12 \\ x - y + z = 9 \end{cases}$$

6.
$$\begin{cases} 2x - y + 3z = 7 \\ 5x - 4y - 2z = 3 \\ 3x + 3y + 2z = -8 \end{cases}$$

Classify each system as consistent or inconsistent, and determine the number of solutions.

7.
$$\begin{cases} 2x - 6y + 4z = 3 \\ -3x + 9y - 6z = -3 \\ 5x - 15y + 10z = 5 \end{cases}$$

8.
$$\begin{cases} -4x + 2y + 2z = -2 \\ 2x - y - z = 1 \\ x + y + z = 2 \end{cases}$$

Solve.

9. At the arcade Sami won 2 blue tickets, 1 yellow ticket and 3 red tickets for 1500 total points. Jamal won 1 blue ticket, 2 yellow tickets, and 2 red tickets for 1225 total points. Yvonne won 2 blue tickets, 3 yellow tickets, and 1 red ticket for 1200 total points Write and solve a system of equations to determine the point value of each type of ticket.

- Possible answer: Both graphs can be determined by finding the intercepts of the linear equations.
- Possible answer: The graph of a two-dimensional linear equation is a line, whereas that of a three-dimensional equation is a plane.
- Possible answer: A plane has length and width, but a line has just length.

LESSON 3-6

Practice A

- $-2x + y = 2$
 - $-3x + 3y = 3$
 - $x = -1, y = 0$
 - $z = 5$
 - $(-1, 0, 5)$
- $(2, 3, -1)$ 3. $(1, -4, 0)$
- $(-3, 2, -2)$ 5. $(1, 1, -2)$
- $$\begin{cases} 2x + z = 28 \\ 3y + 2z = 56 \\ x + y + z = 30; \end{cases}$$
 large: \$16, small: \$6,
medium: \$8

Practice B

- $(0, 0, -5)$ 2. $(-2, 1, 3)$
- $(8, -7, -1)$ 4. $(-4, 0, -6)$
- $(2, -2, 5)$ 6. $(-1, -3, 2)$
- Inconsistent; 0 solutions
- Consistent; infinitely many solutions
- $$\begin{cases} 2b + y + 3r = 1500 \\ b + 2y + 2r = 1225 \\ 2b + 3y + r = 1200 \end{cases}$$
 blue tickets: 125 points; yellow tickets: 200 points; red tickets: 350 points

Practice C

- $(-7, 9, -9)$ 2. $(4, 2.5, -7)$
- Inconsistent; 0 solutions
- Consistent; 1 solution

- $$\begin{cases} 4x + 2y + 8z = 45.20 \\ 7x + 2y + 5z = 35.45 \\ 2x + 9y + 16z = 93.40; \end{cases}$$
 small: \$1.25, medium: \$2.10, large: \$4.50
- Homework: 20%, class participation: 35%, and tests: 45%

Reteach

- $x + 2y - z = -2$
 $3x + y = -1$
 - $2(2x - y + z = -3)$
 $4x - 2y + 2z = -6$
 $5x + y = -3$
 - $$\begin{cases} 3x + y = -1 \\ 5x + y = -3 \end{cases}$$
- No solution; inconsistent
- Infinitely many solutions; dependent

Challenge

- $x = t + 4; y = -2t + 1; z = t$
- $x = t + 6; y = -t - 4; z = t$
- $x = \frac{1}{2}t + \frac{3}{2}; y = -\frac{5}{4}t + \frac{11}{4}; z = t$
- $x = t - 2; y = -2t + 8; z = t$

Problem Solving

- $$\begin{cases} 7t + 8c + 8p = 7.6 \\ 9t + 4c + 8p = 7.4 \\ 6t + 10c + 6p = 7.0 \end{cases}$$
 - 40%
 - 25%
 - 35%
 - 1 more point 3. 5 points
 - D 5. B

Reading Strategies

- Possible answer: You need three different axes to graph three variables. A plane contains only two axes.
- Possible answer: $2x + 4y - 2z = 6$ and $5x + 10y - 5z = 15$
- The planes intersect in one point, so