



1-7 Additional Practice

Solving Linear Systems Using Matrices

Solve each linear system of equations as a matrix.

1.
$$\begin{cases} 6x - y = 8 \\ -3x + 3y = 6 \end{cases}$$

2.
$$\begin{cases} x - 2y + 3z = 18 \\ 9x + 2y - z = -2 \\ -6x - y + 2z = 4 \end{cases}$$

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

Solve the following system of equations.

4.
$$\left[\begin{array}{cc|c} 2 & -6 & -7 \\ -1 & 3 & 14 \end{array} \right]$$

5.
$$\left[\begin{array}{ccc|c} 5 & 3 & -4 & -11 \\ -1 & 6 & 4 & 5 \\ 0 & 8 & -1 & 0 \end{array} \right]$$

6.
$$\left[\begin{array}{ccc|c} 5 & 3 & -4 & -11 \\ -1 & 6 & 4 & 5 \\ 0 & 8 & 6 & 14 \end{array} \right]$$

Solve each system of equations using technology with matrices.

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

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

9.
$$\begin{cases} 3x + 5z = -4 \\ -2x + y - 3z = 9 \\ -x - 2y + 9z = 0 \end{cases}$$

10. The movie theater sells popcorn in three different sizes. A small popcorn costs \$2, a medium popcorn costs \$5, and a large popcorn costs \$10. Ruby sold 250 total containers of popcorn for a total of \$1,726. Ruby sold twice as many large containers as small ones.

a. How many of each size popcorn did Ruby sell?

b. How much money was made from selling the small-size popcorn?

11. Write a matrix for a system of equations that does not have a unique solution.



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Solving Linear Systems Using Matrices

Solve each linear system of equations as a matrix.

1.
$$\begin{cases} 6x - y = 8 \\ -3x + 3y = 6 \end{cases}$$

(2, 4)

2.
$$\begin{cases} x - 2y + 3z = 18 \\ 9x + 2y - z = -2 \\ -6x - y + 2z = 4 \end{cases}$$

(1, -4, 3)

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

(-9, 3, 5)

Solve the following system of equations.

4.
$$\left[\begin{array}{cc|c} 2 & -6 & -7 \\ -1 & 3 & 14 \end{array} \right]$$

(-4.625, 2.25)

5.
$$\left[\begin{array}{ccc|c} 5 & 3 & -4 & -11 \\ -1 & 6 & 4 & 5 \\ 0 & 8 & -1 & 0 \end{array} \right]$$

(2, 0, 3)

6.
$$\left[\begin{array}{ccc|c} 5 & 3 & -4 & -11 \\ -1 & 6 & 4 & 5 \\ 0 & 8 & 6 & 14 \end{array} \right]$$

(3, -2, 5)

Solve each system of equations using technology with matrices.

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

(4, -1, 6)

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

(2, 3, -5)

9.
$$\begin{cases} 3x + 5z = -4 \\ -2x + y - 3z = 9 \\ -x - 2y + 9z = 0 \end{cases}$$

(-3, 6, 1)

10. The movie theater sells popcorn in three different sizes. A small popcorn costs \$2, a medium popcorn costs \$5, and a large popcorn costs \$10. Ruby sold 250 total containers of popcorn for a total of \$1,726. Ruby sold twice as many large containers as small ones.

a. How many of each size popcorn did Ruby sell?

68 small, 46 medium, 136 large

b. How much money was made from selling the small-size popcorn?

\$136

11. Write a matrix for a system of equations that does not have a unique solution.

Sample answer:

$$\left[\begin{array}{cc|c} 2 & -6 & -7 \\ -1 & 3 & 14 \end{array} \right]$$