

## Practice

**Using Matrices to Solve Systems of Equations**

Write the system of linear equations represented by each matrix equation.

1. 
$$\begin{bmatrix} 3 & -2 & 5 \\ 1 & 1 & -4 \\ -2 & 2 & 7 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \\ -5 \end{bmatrix}$$

2. 
$$\begin{bmatrix} 2 & 1 & -3 \\ 5 & 2 & -2 \\ 3 & -3 & 5 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -5 \\ 8 \\ 17 \end{bmatrix}$$

Write a matrix equation for each system.

3. 
$$\begin{aligned} -3x + 2y &= 9 \\ 5x - 3y &= -13 \end{aligned}$$

4. 
$$\begin{aligned} 6x - 2y &= -2 \\ 3x + 3y &= 10 \end{aligned}$$

Solve each matrix equation by using inverse matrices.

5. 
$$\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ -2 \end{bmatrix}$$

6. 
$$\begin{bmatrix} 1 & 5 \\ 2 & -3 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 10 \\ 7 \end{bmatrix}$$

7. 
$$\begin{bmatrix} 1 & 3 & 2 \\ -1 & 2 & 1 \\ 4 & 1 & -2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ -1 \\ -1 \end{bmatrix}$$

8. 
$$\begin{bmatrix} 2 & 3 & -1 \\ 4 & 1 & 5 \\ 1 & 2 & -1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 17 \\ -9 \\ 12 \end{bmatrix}$$