

Multivariable Linear Systems and Row Operations

Write the augmented matrix for each system of linear equations.

1) $5x - 2y = -6$
 $-x + 5y = 15$

2) $-3x - 4y = 20$
 $3x - 5y = 25$

3) $x + 3y - 2z = -11$
 $-2x - 5y + 3z = 17$
 $4x - z = 1$

4) $-2x - 4y - 5z = 11$
 $-x + 4z = -25$
 $-3x - 5y + z = -25$

Write the system of linear equations for each augmented matrix.

5) $\left[\begin{array}{cc|c} 3 & 4 & 1 \\ -3 & 2 & 23 \end{array} \right]$

6) $\left[\begin{array}{cc|c} -5 & 1 & -16 \\ 1 & 5 & -2 \end{array} \right]$

7) $\left[\begin{array}{ccc|c} 3 & -1 & 1 & 8 \\ 0 & -1 & 2 & -10 \\ -2 & 2 & 2 & -8 \end{array} \right]$

8) $\left[\begin{array}{ccc|c} -5 & -4 & 3 & -8 \\ 1 & 0 & 4 & 0 \\ 3 & -5 & 5 & -10 \end{array} \right]$

Find the reduced row-echelon form for each system of linear equations.

9) $5x - 4y = -10$
 $-x + y = 2$

10) $4x - 2y = 2$
 $5x - 2y + z = 7$
 $3x + 4y - z = 3$

11) $x - y + 2z = -1$
 $-3x + 3y + 5z = 3$
 $2x - 2y = -2$

12) $3x + 3y = -12$
 $-4x - 2y + 2z = -14$
 $x + 3y + 2z = 11$

Solve each system of linear equations using Gaussian or Gauss-Jordan elimination.

13) $-3x - 4y = -5$
 $4x + 3y = 9$

14) $2x + 5y + z = -12$
 $-x + 4y + 3z = -4$
 $5x - 2z = -13$

15) $3x + 2y - 3z = 13$
 $4x + 4z = 12$
 $-2x - y + z = -8$

16) $-2x - 4y + 4z = 14$
 $4x + 2y + 4z = -4$
 $x + 2z = -2$

Multivariable Linear Systems and Row Operations

Write the augmented matrix for each system of linear equations.

$$1) \begin{cases} 5x - 2y = -6 \\ -x + 5y = 15 \end{cases}$$

$$\left[\begin{array}{cc|c} 5 & -2 & -6 \\ -1 & 5 & 15 \end{array} \right]$$

$$2) \begin{cases} -3x - 4y = 20 \\ 3x - 5y = 25 \end{cases}$$

$$\left[\begin{array}{cc|c} -3 & -4 & 20 \\ 3 & -5 & 25 \end{array} \right]$$

$$3) \begin{cases} x + 3y - 2z = -11 \\ -2x - 5y + 3z = 17 \\ 4x - z = 1 \end{cases}$$

$$\left[\begin{array}{ccc|c} 1 & 3 & -2 & -11 \\ -2 & -5 & 3 & 17 \\ 4 & 0 & -1 & 1 \end{array} \right]$$

$$4) \begin{cases} -2x - 4y - 5z = 11 \\ -x + 4z = -25 \\ -3x - 5y + z = -25 \end{cases}$$

$$\left[\begin{array}{ccc|c} -2 & -4 & -5 & 11 \\ -1 & 0 & 4 & -25 \\ -3 & -5 & 1 & -25 \end{array} \right]$$

Write the system of linear equations for each augmented matrix.

$$5) \left[\begin{array}{cc|c} 3 & 4 & 1 \\ -3 & 2 & 23 \end{array} \right]$$

$$\begin{cases} 3x + 4y = 1 \\ -3x + 2y = 23 \end{cases}$$

$$6) \left[\begin{array}{cc|c} -5 & 1 & -16 \\ 1 & 5 & -2 \end{array} \right]$$

$$\begin{cases} -5x + y = -16 \\ x + 5y = -2 \end{cases}$$

$$7) \left[\begin{array}{ccc|c} 3 & -1 & 1 & 8 \\ 0 & -1 & 2 & -10 \\ -2 & 2 & 2 & -8 \end{array} \right]$$

$$\begin{cases} 3x - y + z = 8 \\ -y + 2z = -10 \\ -2x + 2y + 2z = -8 \end{cases}$$

$$8) \left[\begin{array}{ccc|c} -5 & -4 & 3 & -8 \\ 1 & 0 & 4 & 0 \\ 3 & -5 & 5 & -10 \end{array} \right]$$

$$\begin{cases} -5x - 4y + 3z = -8 \\ x + 4z = 0 \\ 3x - 5y + 5z = -10 \end{cases}$$

Find the reduced row-echelon form for each system of linear equations.

9) $5x - 4y = -10$

$$-x + y = 2$$

$$\left[\begin{array}{cc|c} 1 & 0 & -2 \\ 0 & 1 & 0 \end{array} \right]$$

10) $4x - 2y = 2$

$$5x - 2y + z = 7$$

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

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 4 \end{array} \right]$$

11) $x - y + 2z = -1$

$$-3x + 3y + 5z = 3$$

$$2x - 2y = -2$$

$$\left[\begin{array}{ccc|c} 1 & -1 & 0 & -1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

12) $3x + 3y = -12$

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

$$x + 3y + 2z = 11$$

$$\left[\begin{array}{ccc|c} 1 & 0 & -1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right]$$

Solve each system of linear equations using Gaussian or Gauss-Jordan elimination.

13) $-3x - 4y = -5$

$$4x + 3y = 9$$

$$(3, -1)$$

14) $2x + 5y + z = -12$

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

$$5x - 2z = -13$$

$$(-3, -1, -1)$$

15) $3x + 2y - 3z = 13$

$$4x + 4z = 12$$

$$-2x - y + z = -8$$

$$(-z + 3, 3z + 2, z)$$

16) $-2x - 4y + 4z = 14$

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

$$x + 2z = -2$$

No solution.