

## 8.3.D3 - INVERSE MATRICES

Determine whether the matrix has an inverse. If so, find its inverse matrix.

1.  $\begin{bmatrix} -10 & -1 \\ -5 & -1 \end{bmatrix}$

2.  $\begin{bmatrix} -2 & -1 \\ -4 & -2 \end{bmatrix}$

3.  $\begin{bmatrix} -4 & 12 \\ 3 & -11 \end{bmatrix}$

Write the system of equations as a matrix equation,  $AX = B$ , and solve using an inverse matrix.

4.  $\begin{cases} 3x + y = -10 \\ -4x - 2y = 12 \end{cases}$

WRITE MATRIX  $A$ DOES  $A^{-1}$  EXIST?FIND  $A^{-1}$ 

SOLUTION:

5.  $\begin{cases} 3x + 5y = -19 \\ -x - 5y = 23 \end{cases}$

WRITE MATRIX  $A$ DOES  $A^{-1}$  EXIST?FIND  $A^{-1}$ MULTIPLY:  $A^{-1}B$ 

SOLUTION:

6.  $\begin{cases} 3x - y = 19 \\ -x - y = -11 \end{cases}$

WRITE MATRIX  $A$ DOES  $A^{-1}$  EXIST?FIND  $A^{-1}$ 

SOLUTION:

7.  $\begin{cases} -6x - 4y = -16 \\ -x - 2y = 4 \end{cases}$

WRITE MATRIX  $A$ DOES  $A^{-1}$  EXIST?FIND  $A^{-1}$ MULTIPLY:  $A^{-1}B$ 

SOLUTION:

Write the system of equations as a matrix equation,  $AX = B$ , and solve using the inverse matrix provided.

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

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

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

$$A^{-1} = \begin{bmatrix} 2 & -1 & -1 \\ 12 & -7 & -2 \\ -5 & 3 & 1 \end{bmatrix}$$

$$x - y + z = 8$$

9.  $2y - z = -7$

$$2x + 3y = 1$$

$$A^{-1} = \begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix}$$