4-8 Using Matrices to Solve Systems of Equations

Objective: Write matrix equations for systems.
Solve systems of equations using matrix equations.

Write a matrix equation for the system and solve.

Ex 1) $x + 3y = 3$
$x + 2y = 7$

Matrix Equation

$\begin{bmatrix} 1 & 3 \\ 1 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 \\ 7 \end{bmatrix}$

$A \cdot X = B$

$A^{-1} \cdot A \cdot X = A^{-1}B$

$X = A^{-1}B$

$\begin{bmatrix} 15 \\ -4 \end{bmatrix}$

$X = 15$, $y = -4$

Ex 2) $5x + 3y = 13$
$4x + 7y = -8$

$\begin{bmatrix} 5 & 3 \\ 4 & 7 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 13 \\ -8 \end{bmatrix}$

$A \cdot X = B$

$X = A^{-1}B$

$\begin{bmatrix} 5 \\ -4 \end{bmatrix}$

$X = 5$, $y = -4$

Ex 3) $3x - 2y + z = 0$
$2x + 3y - z = 17$
$5x - y + 4z = -7$

$\begin{bmatrix} 3 & -2 & 1 \\ 2 & 3 & -1 \\ 5 & -1 & 4 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 17 \\ -7 \end{bmatrix}$

$A \cdot X = B$

$X = A^{-1}B$

$\begin{bmatrix} 3 \\ 2 \\ -5 \end{bmatrix}$

$X = 3$, $y = 2$, $z = -5$

Calcular Steps

2nd matrix
- Edit
- #1 "A"
- Enter size of matrix A
- Enter in Matrix A
- 2nd Quit

2nd Matriy
- Edit
- #2 "B"
- Enter sizeof matrix B
- Enter in Matrix B
- 2nd Quit

2nd Matrix
- choose #1 A

* Select X^{-1}

2nd Matrix
- choose #2 B

*Select enter

*you will Then get your answer

$X = A^{-1}B$