4.8 – Using Matrices to Solve Systems of Equations Alg 2 Trig G



A ________ for a system of equations consists of the product of the coefficient and variable matrices on the left and the constant matrix on the right of the equals sign.

Write a matrix equation for each system of equations:

1.
$$3x - 7y = 12$$
$$x + 5y = -8$$

$$\begin{cases} x+3y=-8 \\ 3 & -7 \\ 1 & 5 \\ 2 & 4 \end{cases} = \begin{bmatrix} 12 \\ -8 \end{bmatrix}$$
Coefficients x

3.
$$5x + 2y = 18$$
$$x = -4y + 25$$
$$x + 4y = 25$$

$$2x - y + 3z = -7$$
2. $x + 3y - 4z = 15$

$$7x + 2y + z = -28$$

$$\begin{bmatrix} 2 & -1 & 3 \\ 1 & 3 & -4 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -7 \\ 15 \end{bmatrix}$$

$$\begin{bmatrix} 5 & 2 \\ 1 & 4 \end{bmatrix} \begin{bmatrix} X \\ Y \end{bmatrix} = \begin{bmatrix} 18 \\ 25 \end{bmatrix}$$

How to solve a matrix equation in your calculator:

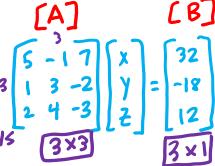
$$5x - y + 7z = 32$$
$$x + 3y - 2z = -18$$

$$2x + 4y - 3z = 12$$

WRITE THE MATRIX EQUATION:

a matrix:

Rows x columns



PRESS 2^{nd} x^{-1} (MATRX)

GO OVER TO $\overline{\text{EDIT}}$ and CHOOSE THE $\left[A\right]$

ENTER THE SIZE OF THE FIRST MATRIX (rows x columns)

ENTER THE VALUES IN THE MATRIX YOU WROTE

AGAIN, PRESS 2^{nd} x^{-1} (MATRX)

GO OVER TO $\overline{\text{EDIT}}$ and CHOOSE THE $\lceil B \rceil$

ENTER THE SIZE OF THE SECOND MATRIX (rows x columns)

ENTER THE VALUES IN THE MATRIX YOU WROTE

PRESS 2nd MODE (QUIT)

PRESS 2^{nd} x^{-1} (MATRX)

STAY ON NAMES and CHOOSE 1: [A]

PRESS THE
$$x^{-1}$$
PRESS 2^{nd} x^{-1} (MATRX)

STAY ON NAMES and CHOOSE 1: B

(YOU SHOULD SEE A^{-1} B ON THE SCREEN)

PRESS ENTER



The resulting matrix is your answer!!!!

$$X = 39.44$$

 $Y = -38.56$
 $Z = -29.11$

Practice!

$$2x + 3y = 6$$
$$3x - 4y = 7$$

$$X = 2.65$$

 $Y = .24$

$$\begin{array}{c|c}
 & Ir - Is = 1 \\
3s = 12 - 2r
\end{array}$$

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

$$6x - y + 2z = -4$$

3.
$$-3x + 2y - z = 10$$

$$x + y + z = 3$$

$$a-b+c=5$$

4.

$$3a + 2b - c = 0$$

$$2a + 3b = 8$$

