Solve this system of equations.

This would probably be easiest using Elimination.

$3(8x - 5y = -23) \rightarrow \quad 24x - 15y = -69$

$4(6x + 7y = 15) \rightarrow \quad -(24x + 28y = 60)$

$-43y = -129$

$\frac{-43y}{-43} = \frac{-129}{-43} \rightarrow y = 3$

Using one of the original equations substitute 3 for y and solve for x:

$6x + 7y = 15 \rightarrow$

$6x + 7(3) = 15$

$6x + 21 = 15$

$6x = -6$

$x = -1$

Sol is: (-1, 3)

Turning a system of equations into a matrix equation: $A \cdot X = B$

$8x - 5y = -23$

$6x + 7y = 15$

A • X = B

Matrix A is called the Coefficient Matrix:

2×2

$\begin{bmatrix} 8 & -5 \\ 6 & 7 \end{bmatrix}$

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Matrix X is called the Variable Matrix:

2×1

$\begin{bmatrix} x \\ y \end{bmatrix}$

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Matrix B is called the Constant (or Answer) Matrix:

2×1

$\begin{bmatrix} -23 \\ 15 \end{bmatrix}$

Solve this by doing:

$X = A^{-1} \cdot B = \begin{bmatrix} -1 \\ 3 \end{bmatrix}$

as an ordered pair the answer is: (-1, 3)

When using matrices to solve a system of equations both equations must be in Standard Form.

When you solve you will always do this:

$$\begin{bmatrix} X \\ Y \end{bmatrix} = A^{-1} \cdot B$$

Use matrices to solve this system of equations:

$11a - 15b = -145$

$13b + 8a = 38 \rightarrow$ rewrite this so that the variables on the left side are in the same order as the top equation

$11a - 15b = -145$

$8a + 13b = 38$

Write this system as a matrix equation:

$\begin{bmatrix} 11 & -15 \\ 8 & 13 \end{bmatrix} X = \begin{bmatrix} -145 \\ 38 \end{bmatrix}$

$A \quad X = B$

$X = A^{-1} B = \begin{bmatrix} -5 \\ 6 \end{bmatrix}$

as an ordered pair the answer is: (-5, 6)

Use matrices to solve this system of equations:

2.7x - 3.4y = 2.47

8.6x + 9.5y = 30.23

Turn this system into a matrix equation:

$$\begin{bmatrix} 2.7 & -3.4 \\ 8.6 & 9.5 \end{bmatrix} \times = \begin{bmatrix} 2.47 \\ 30.23 \end{bmatrix}$$

A B

AX = B

Solve this by doing:

$X = A^{-1} \cdot B = \begin{bmatrix} 2.3 \\ 1.1 \end{bmatrix}$

as an ordered pair the answer is: (2.3, 1.1)

Solve. $\frac{2}{3}x - \frac{5}{6}y = 31$

$\frac{7}{4}x + \frac{1}{9}y = 40$

Turn this system into a matrix equation:

$$\begin{bmatrix} \frac{2}{3} & -\frac{5}{6} \\ \frac{7}{4} & \frac{1}{9} \end{bmatrix} \times = \begin{bmatrix} 31 \\ 40 \end{bmatrix}$$

A B

AX = B

Solve this by doing:

$X = A^{-1} \cdot B = \begin{bmatrix} 24 \\ -18 \end{bmatrix}$

as an ordered pair the answer is: (24, -18)

Use matrices to solve this system of equations:

y = 4x - 8 ⟶ −4x + y = −8

6x + 7y = -5

Turn this system into a matrix equation:

$$\begin{bmatrix} -4 & 1 \\ 6 & 7 \end{bmatrix} \times = \begin{bmatrix} -8 \\ -5 \end{bmatrix}$$

A B

AX = B

Solve this by doing:

$X = A^{-1} \cdot B = \begin{bmatrix} 1.5 \\ -2 \end{bmatrix}$

as an ordered pair the answer is: (1.5, -2)

Solve this system of equations. Give answer as an ordered triple.

4x - y + 3z = -5

-3x + 5y + z = 10

6x - 7y - 8z = 1

Turn this system into a matrix equation:

$$\begin{bmatrix} 4 & -1 & 3 \\ -3 & 5 & 1 \\ 6 & -7 & -8 \end{bmatrix} \times = \begin{bmatrix} -5 \\ 10 \\ 1 \end{bmatrix}$$

A B

3x3 3x1

AX = B

Solve this by doing:

$X = A^{-1} \cdot B = \begin{bmatrix} 1 \\ 3 \\ -2 \end{bmatrix}$

as an ordered triple the answer is: (1, 3, -2)