Find this product without a graphing calculator.

$$\begin{bmatrix} 3 & 2 & -6 \\ 1 & -4 & 7 \end{bmatrix} \begin{bmatrix} -5 & 0 \\ 9 & -2 \\ 10 & -8 \end{bmatrix} = \begin{bmatrix} 4 & 5 \\ 29 & -48 \end{bmatrix}$$

$$2 \times 3 \quad 3 \times 2 \qquad 2 \times 2$$

$$a = \text{Row } 1 \times \text{Col } 1 \qquad \Rightarrow a = -15 + 18 - 60$$

$$b = \text{Row } 1 \times \text{Col } 2 \qquad \Rightarrow 5 - 36 + 70$$

$$c = \text{Row } 2 \times \text{Col } 1 \qquad \Rightarrow 6 - 56$$

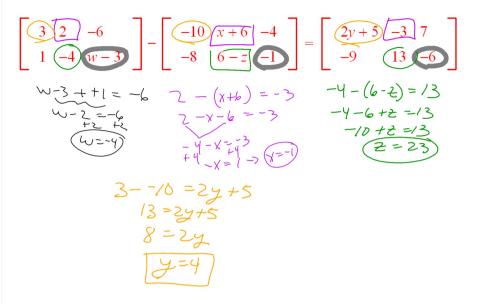
$$d = \text{Row } 2 \times \text{Col } 2 \qquad \Rightarrow 6 - 56$$

Regardless of dimensions, to solve the following matrix equation: $A \cdot X = B$

You will always find matrix X by doing the following:

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

Find the value of each variable



Solve this matrix equation.

this is one method

here is another method

$$\begin{vmatrix}
-5 & 1 \\
10 & 3
\end{vmatrix} - 4 = \begin{vmatrix}
-2 & 6 \\
-8 & -1
\end{vmatrix} = \begin{vmatrix}
-183 & -109 \\
58 & -39
\end{vmatrix}$$

$$\begin{vmatrix}
-15 & 3 \\
30 & 9
\end{vmatrix} + \begin{vmatrix}
5 & -24 \\
32 & 4
\end{vmatrix} \times = \begin{vmatrix}
-163 & -109 \\
56 & -39
\end{vmatrix}$$

$$\begin{vmatrix}
-15 & 3 \\
32 & 4
\end{vmatrix} \times = \begin{vmatrix}
-163 & -109 \\
56 & -39
\end{vmatrix}$$

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$$\begin{vmatrix}
-15 & 3 & -109 \\
56 & -39
\end{vmatrix}$$

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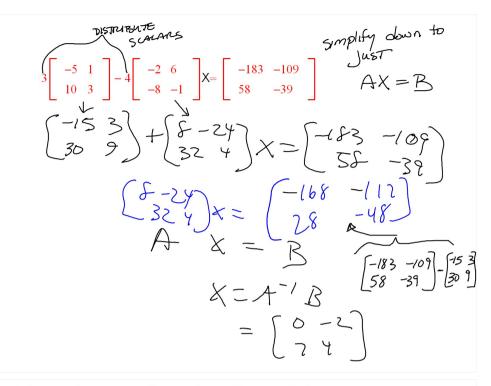
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\end{vmatrix}$$

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

When you solve you will always do this:

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



Solve each system of equations. State solutions as orderd pairs or triples. If using matrices write down the two matrices you used.

$$4x + 9y = 11$$

$$-7x + 11y = 61$$

$$\begin{pmatrix} 4 & 9 \\ -7 & 11 \end{pmatrix} \times = \begin{bmatrix} 11 \\ 61 \end{bmatrix}$$

$$X = A^{-1}B = \begin{bmatrix} -4 \\ 3 \end{bmatrix}$$

$$y = 4.75x + 16.3$$

$$6.1x - 1.08y = -20.126$$

$$-4.75$$

$$6.1 - 1.08$$

$$-1.08$$

$$= -2.6 - 3.95$$

$$-20.126$$

$$\Rightarrow = -2.6$$

$$-2.6 - 3.95$$

The cost of a pen is \$0.03 less than eight times the cost of a pencil. I bought a dozen pens and fifteen pencils for \$7.41. Write and solve a system of equations to find the cost of each pen and each pencil. X = 65 + 60 X = 84 = -.03

$$\begin{bmatrix}
 1 & -8 \\
 12 & 15
 \end{bmatrix} X = \begin{bmatrix} -.03 \\
 7.41
 \end{bmatrix}
 A X = B
 X = A^{-1}B = \begin{bmatrix} 0.53 \\
 0.67
 \end{bmatrix}$$

$$4a + 9b - c = -65$$

$$-6b + 7c = 83$$

$$8c - 5a + b = 17$$

$$\begin{pmatrix} 4 & 9 & -1 \\ 0 & 6 & 7 \\ -5 & 1 & 8 \end{pmatrix} \quad \begin{cases} -65 \\ 83 \\ 17 \end{cases}$$

$$\lambda = A^{-1} \beta = \begin{bmatrix} 38 \\ 5 \end{bmatrix}$$

Ine cost of apples is \$1.99 per pound and the cost of pears is \$2.48 per pound. When I bought some apples and pears I spent \$22.61. It turns out that I bought twice as many pounds of apples as pears. Write and solve a system of equations to find out how many pounds of each I bought.

7 pounds of apples 3.5 pounds of pears

$$- \times = A^{-1} B = \begin{bmatrix} 7 \\ 3.5 \end{bmatrix}$$