

Name: _____

Date: _____

Matrices Homework

Use the graphing calculator and matrices to solve the following systems of equations.

1)
$$\begin{aligned} 2x - 3y &= -13 \\ 4x + y &= -5 \end{aligned}$$

$$\begin{bmatrix} 2 & -3 \\ 4 & 1 \end{bmatrix}^{-1} \begin{bmatrix} -13 \\ -5 \end{bmatrix} = \boxed{(-2, 3)}$$

2)
$$\begin{aligned} 3x - 2y &= 5 \\ -x + 5y &= 7 \end{aligned}$$

$$\begin{bmatrix} 3 & -2 \\ -1 & 5 \end{bmatrix}^{-1} \begin{bmatrix} 5 \\ 7 \end{bmatrix} = \boxed{(3, 2)}$$

3)
$$\begin{aligned} x + 2y - z &= 3 \\ 3x + 7y - 3z &= 12 \\ -2x - 4y + 3z &= -5 \end{aligned}$$

$$\begin{bmatrix} 1 & 2 & -1 \\ 3 & 7 & -3 \\ -2 & -4 & 3 \end{bmatrix}^{-1} \begin{bmatrix} 3 \\ 12 \\ -5 \end{bmatrix} =$$

$$\boxed{(-2, 3, 1)}$$

4)
$$\begin{aligned} x + 4y - 2z &= 0 \\ 2x + y + z &= 6 \\ -2x + 3y - 5z &= -13 \end{aligned}$$

$$\begin{bmatrix} 1 & 4 & -2 \\ 2 & 1 & 1 \\ -2 & 3 & -5 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ 6 \\ -13 \end{bmatrix} =$$

$$\left(\frac{3}{4}, \frac{11}{8}, \frac{25}{8} \right)$$

Use the graphing calculator to find the inverse of each of the following matrices

5) $A = \begin{bmatrix} 0 & -2 \\ -1 & -9 \end{bmatrix}$

$$A^{-1} = \begin{bmatrix} 4.5 & -1 \\ -1.5 & 0 \end{bmatrix}$$

6) $B = \begin{bmatrix} 1 & -1 \\ -6 & -3 \end{bmatrix}$

$$B^{-1} = \begin{bmatrix} 1/3 & -1/9 \\ -2/3 & -1/9 \end{bmatrix}$$

WITHOUT USING A CALCULATOR add, subtract, or multiply the following matrices (if possible)

$$7) \begin{bmatrix} 0 & 1 \\ -5 & 4 \end{bmatrix} + \begin{bmatrix} 2 & 1 \\ -3 & -7 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 2 \\ -8 & -3 \end{bmatrix}$$

$$8) 5 \begin{bmatrix} 0 & -9 \\ 5 & 3 \end{bmatrix} - 4 \begin{bmatrix} 7 & 5 \\ 1 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -45 \\ 25 & 15 \end{bmatrix} - \begin{bmatrix} 28 & 20 \\ 4 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -28 & -65 \\ 21 & 15 \end{bmatrix}$$

$$9) \begin{bmatrix} 4 & 8 & 3 \end{bmatrix} - \begin{bmatrix} 5 \\ -1 \\ -6 \end{bmatrix}$$

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$$10) \begin{bmatrix} 2 & -4 \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ 0 & 4 \end{bmatrix}$$

$$1 \times 2 \quad 2 \times 2 \quad = 1 \times 2$$

$$\begin{bmatrix} 2+0 & 0+(-16) \end{bmatrix} = \begin{bmatrix} 2 & -16 \end{bmatrix}$$

$$11) \begin{bmatrix} -3 & 4 \\ 2 & 1 \end{bmatrix} \cdot \begin{bmatrix} 0 & 5 \\ 2 & 3 \end{bmatrix}$$

$$2 \times 2 \quad 2 \times 2 \quad = 2 \times 2$$

$$\begin{bmatrix} 0+8 & -15+12 \\ 0+2 & 10+3 \end{bmatrix}$$

$$\begin{bmatrix} 8 & -3 \\ 2 & 13 \end{bmatrix}$$

$$12) \begin{bmatrix} -1 \\ 2 \end{bmatrix} \cdot \begin{bmatrix} 7 & 6 & 1 \\ 2 & -4 & 0 \end{bmatrix}$$

$$2 \times 1 \quad 2 \times 3$$

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