Elementary Row Operations:

1) Interchange 2 rows

2) Multiply a Row by a Constant

3) Add Rows

Name_____

Advanced Algebra

Unit 6: Assignment #16

Elementary Row Operations on 3 by 3 Day #2

Translate the following 3 by 3 systems of equations into a Matrix and perform elementary row operations to solve the system.

Your Goal is to get the following:

$$\begin{bmatrix} 1 & \# & \# \\ 0 & \# & \# \\ 0 & 0 & \# \end{bmatrix}$$

1) $\begin{cases} x - y - 2z = 3 \\ 0x + 2y + 3z = 8 \\ 0x + 0y + z = 2 \end{cases}$

2) $\begin{cases} x - 2y + z = 7 \\ 4x + 2y - z = 3 \\ x + y - 5z = 13 \end{cases}$

3) $\begin{cases} 2x + y + z = -3 \\ 3x - 2y + 4z = 9 \\ x + 2y - 2z = -13 \end{cases}$

4) $\begin{cases} -3x + y - 2z = -11 \\ x - 3y + z = 5 \\ 2x + 2y - z = -2 \end{cases}$

5) $\begin{cases} x - y + 2z = 10 \\ -3x + y - z = -11 \\ 2x - 2y + z = 11 \end{cases}$

6) $\begin{cases} 2x + 10y + 0z = 28 \\ x + 3y + 4z = 22 \\ x + 5y - z = 10 \end{cases}$

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

8) $\begin{cases} x+y+z=7 \\ 2x+3y+z=7 \\ 3x+2y-z=-12 \end{cases}$

1) $\begin{bmatrix} 1 & -1 \\ 3 & -1 \end{bmatrix} * \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ -6 \end{bmatrix}$

Let A= $\begin{bmatrix} 1 & -1 \\ 3 & -1 \end{bmatrix}$ then

$[A^{-1}] * [A] * \begin{bmatrix} x \\ y \end{bmatrix} = [A^{-1}] * \begin{bmatrix} 2 \\ -6 \end{bmatrix}$

$\begin{bmatrix} x \\ y \end{bmatrix} = [A^{-1}] * \begin{bmatrix} 2 \\ -6 \end{bmatrix}$

The above shows the proper notation that you need to show when you are solving a matrix system completely. Now you should go on an actually find the inverse so you can solve the 2 by 2.

$\begin{bmatrix} a & b \\ c & d \end{bmatrix} * \begin{bmatrix} 1 & -1 \\ 3 & -1 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Now get your 2 systems of equations and solve for a,b,c,d which will be the inverse Matrix.

Then finally multiply your inverse by $\begin{bmatrix} 2 \\ -6 \end{bmatrix}$

(Backside)

2) Now you do on your own completely.

$$\begin{cases} x - y = -1 \\ x + y = 7 \end{cases}$$

Translate into a Matrix First!! Look above. Show all the work. This is an exact problem on the test. You need to show everything