Name ____Solutions_____ Quiz 1

1) Find one solution of the system of equations below.

$$\begin{aligned} x_1 - 2x_2 + x_3 + 2x_4 \quad + x_5 &= 0 \\ x_3 \quad - x_4 + 3x_5 &= 5 \end{aligned}$$

The simplest solution is to take all the free variables as zero: $x_2 = 0; x_4 = 0; x_5 = 0$. Then we get:

$$\begin{aligned} x_1 + x_3 &= 0 \\ x_3 &= 5 \end{aligned}$$

This gives us the solution:

$$(-5,0,5,0,0)$$

Other choices of x_2, x_4, and x_5 are valid, but will be more work.

Note that a solution requires values for all five variables.

2) What are the free variables in the system of equations above?

x_2, x_4, and x_5.

3) Compute the matrix multiplication problem below.

$$\begin{bmatrix} 3 & 1 & -2 & 4 \\ 1 & 0 & 2 & -1 \\ 0 & 1 & 2 & -1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 1 \\ 1 & 0 & 1 \\ 0 & -1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & -2 & 6 \\ 3 & 1 & 2 \\ 2 & 3 & 2 \end{bmatrix}$$