Math 2418 Linear Algebra Quiz #2

[10] 1.) Prove that matrix multiplication for SQUARE matrices is not commutative (I.e., give two specific square matrices with real numbers and show with these matrices $AB \neq BA$).

$$\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} \neq \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$$

There are many other correct answers.

[10] 2.) Given the following augmented matrix, solve

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & -3 \\ 0 & 1 & 2 & 0 & 1 & 5 \\ 0 & 0 & 0 & 1 & -3 & 2 \end{bmatrix}$$

Since the above metrix is in REF, we know the answer is

$$(-3,\ 5-2s-t,\ s,\ 2+3t,\ t)$$