

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

$$\left[\begin{array}{cccccc} 1 & 0 & 0 & 0 & 0 & 8 \\ 0 & 1 & 2 & 0 & 1 & -5 \\ 0 & 0 & 0 & 1 & -3 & 4 \end{array} \right]$$

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

$$(8, -5 - 2s - t, s, 4 + 3t, t)$$