Quiz 3 MATH 304 Section 3 Name: Solution

To receive credit, the solution to problems will be clearly presented. Partial credit will not be awarded for problems worked without comments. Unwanted work should be completely erased or clearly scratched out.

$$A=\begin{bmatrix}1&2&3\\2&1&4\end{bmatrix} \qquad B=\begin{bmatrix}1&0\\2&1\\3&2\end{bmatrix} \qquad C=\begin{bmatrix}3&-2\\2&5\end{bmatrix}$$

$$D=\begin{bmatrix}3&-1&3\\4&1&5\\2&1&3\end{bmatrix} \qquad E=\begin{bmatrix}2&-4&5\\0&1&4\\3&2&1\end{bmatrix}$$

If possible, compute the following expressions. If not possible, briefly explain why.

1. $2D-3E$.

$$=2\begin{bmatrix}3&-1&3\\4&1&5\\2&1&3\end{bmatrix}-3\begin{bmatrix}2&-4&5\\0&1&4\\3&2&1\end{bmatrix}=\begin{bmatrix}6&-2&6\\8&2&10\\4&2&6\end{bmatrix}+\begin{bmatrix}-6&12&-15\\0&-3&-12\\-9&-6&-3\end{bmatrix}$$

$$=\begin{bmatrix}0&10&-9\\8&-1&-2\\-5&-4&3\end{bmatrix}$$

2. AB and BA.

$$AB=\begin{bmatrix}[1\ 2\ 3]B\\[2\ 1\ 4]B\end{bmatrix}=\begin{bmatrix}1[1\ 0]+2[2\ 1]+3[3\ 2]\\2[1\ 0]+1[2\ 1]+4[3\ 2]\end{bmatrix}=\begin{bmatrix}14&8\\16&9\end{bmatrix}$$

$$BA=\begin{bmatrix}[1\ 0]A\\[2\ 1]A\\[3\ 2]A\end{bmatrix}=\begin{bmatrix}1[1\ 2\ 3]+0[2\ 1\ 4]\\2[1\ 2\ 3]+1[2\ 1\ 4]\\3[1\ 2\ 3]+2[2\ 1\ 4]\end{bmatrix}$$

$$=\begin{bmatrix}1&2&3\\4&5&10\\7&8&17\end{bmatrix}$$

3. $DB+C$.

(size 3x2 + size 2x2 is impossible!)

4. $AB+C^2$.

$$=\begin{bmatrix}14&8\\16&9\end{bmatrix}+\begin{bmatrix}5&-16\\16&21\end{bmatrix}$$

$$=\begin{bmatrix}19&-8\\32&30\end{bmatrix}$$

$$C^2=\begin{bmatrix}[3\ -2]C\\[2\ 5]C\end{bmatrix}$$

$$=\begin{bmatrix}3[3\ -2]+(-2)[2\ 5]\\2[3\ -2]+5[2\ 5]\end{bmatrix}$$

$$=\begin{bmatrix}[9\ -6]+[-4\ -10]\\[6\ -4]+[10\ 25]\end{bmatrix}$$

$$=\begin{bmatrix}5&-16\\16&21\end{bmatrix}$$