Math 4A Week 8 – November 24, 2014

1. Given two matrices, A and B, does AB=BA? If false, find a counter example.

2.
$$C = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 0 & 3 \\ 0 & 0 & 4 \end{bmatrix} \qquad D = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 4 & 4 \\ 0 & 0 & 8 \end{bmatrix}$$

(i). Are C and D invertible? If yes, find the inverse.
(ii). C and D are upper triangular matrices. We can easily find the determinants by:

3. Given matrix A, does $Ax = b$ have a unique solution?
$$A = \begin{bmatrix} 1 & 2 & 3 & 4 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 5 & 4 & 3 & 2 & 1 \end{bmatrix}$$

4. Find the determinant of B.
$$B = \begin{bmatrix} 1 & 2 & 3 & 4 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 2 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 1 & 0 \\ 5 & 4 & 3 & 2 & 1 \end{bmatrix}$$

5. Given B from above, does $\det(5B) = 5\det(B)$? Check with $I_{2\times 2}$.

6. $\det \begin{bmatrix} a & b \\ c & d \end{bmatrix} = 4$. What is $\det \begin{bmatrix} c & d \\ c-2a & d-2b \end{bmatrix}$?