Homework #5
Math 201-003
Dr. Ramesh Garimella
Due: August 7, 2023 (in class)

1. If a matrix A is 5 x 3 and the product AB is 5 x 7, What is the size of B?

2. How many rows does B have if BC is a 3 x 4 matrix?

3. Let A = $\begin{bmatrix} 2 & 5 \\ -3 & 1 \end{bmatrix}$ and B = $\begin{bmatrix} 4 & -5 \\ 3 & k \end{bmatrix}$. What the value of K that will make AB = BA.

4. Find x_1, x_2, x_3, x_4 in the following product: $\begin{bmatrix} 1 & -2 \\ -2 & 5 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & * \\ x_3 & x_4 & * \end{bmatrix} = \begin{bmatrix} -1 & 2 & -1 \\ 6 & -9 & 3 \end{bmatrix}$.

(Hint: First, compute the first two columns of the left-hand side matrix product. Next, compare the resulting matrix with the one on the right-hand side. By doing this, you will have a system of four equations with four unknowns x_1, x_2, x_3, x_4 . Solve this system to determine the values of x_1, x_2, x_3, x_4 .)

5. Find the inverse of the matrix $\begin{bmatrix} 1 & -2 & 0 \\ 4 & -7 & 3 \\ -2 & 6 & -4 \end{bmatrix}$

6. Find the LU factorization of $\begin{bmatrix} 2 & -4 & 2 \\ 1 & 5 & -4 \\ -6 & -2 & 4 \end{bmatrix}$