

Homework Assignment #3

(NYC Summer 2006)

Show all your work!

1. Use Cramer's Rule to solve the following system for x_3 *only*.

$$\begin{aligned}2x_1 + 3x_2 + x_3 - 2x_4 &= -1 \\-x_1 + 2x_2 - 3x_3 + 5x_4 &= 2 \\4x_1 - x_2 + 2x_3 + x_4 &= 5 \\3x_1 - 6x_2 + 9x_3 + 2x_4 &= -6\end{aligned}$$

2. Let A be an $n \times n$ matrix, and let B be the matrix which results when the rows of A are written in reverse order (the first row of A is the last row of B , the second row of A is the second-to-last row of B , and so on). Find an explicit formula relating the determinant of A to the determinant of B .

3. Solve the system using the LU factorization method:

$$\begin{aligned}2x_1 + x_2 + x_3 &= 3 \\4x_1 + 5x_2 &= 7 \\6x_1 + 15x_2 - x_3 &= 5\end{aligned}$$