

Homework 4: Turn in your work electronically to TA by December 17.

1. Find a matrix T with cofactor matrix

$$\begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 3 & 1 \end{bmatrix}$$

2. Find $|AB|$ where

$$\mathbf{A} = \begin{bmatrix} 1 & 7 & 2 \\ 5 & 7 & 3 \\ 8 & 3 & 5 \end{bmatrix}, \quad \mathbf{B} = \begin{bmatrix} 3 & 6 & 5 \\ 1 & 0 & 9 \\ 1 & 7 & 5 \end{bmatrix}$$

3. Solve the following system of linear equations by Cramer's rule

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

4. C_n is an $n \times n$ matrix with 1s above and below the main diagonal, and 0s at other places. Find $|C_{10}|$. (hint: recursion by cofactor expansion.)

5. Find the inverse of

$$\mathbf{M} = \begin{bmatrix} 3 & 0 & 1 & 1 \\ 0 & 9 & 6 & 0 \\ 4 & 3 & 4 & 2 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$