Homework Assignment #1

Qs. 1. Calculating Determinants (3×3)

We can calculate the Determinant $|M|$ by 'expanding' along row i,

$$|M| = \sum_{j=1}^{n} (-1)^{i+j} * a_{ij} * M_{ij}$$

Find the Determinant of

- $A = \begin{vmatrix} -2 & 1 & -4 \\ 1 & 1 & 2 \\ 3 & 7 & 6 \end{vmatrix}$, by expanding along row 1.
- $B = \begin{vmatrix} 7 & 2 & 1 \\ 0 & 1 & 2 \\ 3 & 7 & 6 \end{vmatrix}$, by expanding along row 2.
- $C = \begin{vmatrix} 1 & 0 & 2 \\ 2 & 1 & 0 \\ -1 & 2 & 3 \end{vmatrix}$, by expanding along row 3.

Qs. 2. Cramer's Rule

The points $(-1, 12)$, $(1, 2)$ and $(2, 0)$ lie on the quadratic curve defined by the equation,
$y = a * x^2 + b * x + c$.
Using the approach from Cramer's Rule, find the coefficients, a, b and c.

Qs. 3. Triangular Matrices

Let

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

determine $|A * B|$
where $|M|$ is the determinant of the matrix M.