
Evaluate the determinant of the given matrix by cofactor expansion along the row/column.

1. $\mathbf{A} = \begin{bmatrix} 3 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

a. along the first row.

b. Along the second column

2. Use Row Echelon Form to find the determinant of a the given matrix

$$\mathbf{B} = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix}$$

3. Find the Adjoint of matrix \mathbf{B} in the previous problem.

4. Use Cramer's Rule to solve the system of equations then find the number of Multiplication additions required to find the solution.

$$\begin{cases} x + 2y + 2z = 3 \\ 2x + y + z = 3 \\ x - y + z = 0 \end{cases}$$

5. Use the Adjoint of the associative matrix of the given system below to find the inverse then use it to solve the system.

$$x - y + z = 3$$

$$2x - y + z = 5$$

$$3x - 2y + z = 8$$