Determinant of a 3×3 matrix.

$$A = \begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}$$

$$Det(A) = \begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix}$$

Determinant of a 3×3 matrix.

Terminology : Minor of a Matrix

- Each element of a matrix has a '*minor matrix*'.
- This is the square matrix formed by deleting the row and the column of the element from the matrix.
- The **Minor** is the determinant of this 'minor matrix'.
- For each element, there is a minor.

Determinant of a 3×3 matrix.

Minor matrix of element a

$$\begin{pmatrix} a & \dots & \dots \\ \dots & e & f \\ \dots & h & i \end{pmatrix}$$

Minor of element a is computed as:

$$\begin{vmatrix} e & f \\ h & i \end{vmatrix} = ei - hf$$

Determinant of a 3×3 matrix.

Minor matrix of element b

$$\begin{pmatrix} \dots & b & \dots \\ d & \dots & f \\ g & \dots & i \end{pmatrix}$$

Minor of element b is computed as:

$$\begin{vmatrix} d & f \\ g & i \end{vmatrix} = di - gf$$

Determinant of a 3×3 matrix.

Minor matrix of element c

$$\begin{pmatrix} \dots & \dots & c \\ d & e & \dots \\ g & h & \dots \end{pmatrix}$$

Minor of element c is computed as:

$$\begin{vmatrix} d & e \\ g & h \end{vmatrix} = dh - ge$$

Determinant of a 3×3 matrix.

Minor matrix of element e

$$\begin{pmatrix} a & \dots & c \\ \dots & e & \dots \\ g & \dots & i \end{pmatrix}$$

Minor of element e is computed as:

$$\begin{vmatrix} a & c \\ g & i \end{vmatrix} = ai - gc$$

Determinant of a 3×3 matrix.

Sign Array

$$\begin{pmatrix} + & - & + \\ - & + & - \\ + & - & + \end{pmatrix}$$