

$$\chi_A(\lambda) = -\lambda^3 + c_2\lambda^2 - c_1\lambda + c_0$$

$$\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix} = a + e + i + \det \begin{bmatrix} a & b \\ d & e \end{bmatrix} + \det \begin{bmatrix} e & f \\ h & i \end{bmatrix} + \det \begin{bmatrix} a & c \\ g & i \end{bmatrix} = \det(A)$$

The diagram illustrates the cofactor expansion of a 3x3 matrix A . The matrix is expanded along the first row, resulting in the expression $a + e + i + \det \begin{bmatrix} a & b \\ d & e \end{bmatrix} + \det \begin{bmatrix} e & f \\ h & i \end{bmatrix} + \det \begin{bmatrix} a & c \\ g & i \end{bmatrix}$. The terms a, e, i are highlighted in blue, corresponding to the main diagonal elements. The 2x2 determinants are highlighted in orange, corresponding to the submatrices formed by removing the first row and the second column. The entire matrix A is highlighted in green.