

Definition: If A is an $n \times n$ matrix, then the number obtained by multiplying the entries in any row or column of A by the corresponding cofactors and adding the resulting products is called the **determinant of A** , and the sums themselves are called **cofactor expansions of A** . That is,

$$\det(A) = a_{1j}C_{1j} + a_{2j}C_{2j} + \dots + a_{nj}C_{nj} \text{ (cofactor expansion along the } j\text{th column)}$$
$$= a_{i1}C_{i1} + a_{i2}C_{i2} + \dots + a_{in}C_{in} \text{ (cofactor expansion along the } i\text{th row)}$$

Example: Compute the determinant of the matrix A above.

#11 Use the arrow technique of Figure 2.1.1 to evaluate the determinant.

$$\begin{vmatrix} -2 & 1 & 4 \\ 3 & 5 & -7 \\ 1 & 6 & 2 \end{vmatrix}$$
