NOTATION · CHEAT SHEET

Determinant Notation at a Glance

The marks from the notation cards across the determinant pages: how each is read and what it means. Every group links to the full card on its page.

PROPERTIES

$\det(A)$	**THE DETERMINANT OF A** A number from a square matrix; brackets optional, as in $\det A$.
$\lvert A\rvert$	**DETERMINANT OF A, WITH BARS** Bars around the name, or bars replacing the brackets of the array.
Δ	**DELTA** The school name for the determinant of a system.

COFACTORS

$M_{ij},\ C_{ij}$	**MINOR AND COFACTOR AT I, J** Numbers, despite the capitals: $C_{ij} = (-1)^{i+j} M_{ij}$.
$A^{(i,j)}$	**A WITH ROW I AND COLUMN J REMOVED** The smaller matrix whose determinant is M_{ij}.
$\operatorname{adj}(A) = C^T$	**THE ADJUGATE OF A** The transpose of the cofactor matrix, not the cofactor matrix itself.

GEOMETRY

$\det(A) < 0$	**A NEGATIVE DETERMINANT** The map flips orientation.
$\lvert\det(A)\rvert$	**ABSOLUTE VALUE OF THE DETERMINANT** The factor by which areas or volumes scale.
$\det J_T$	**THE JACOBIAN DETERMINANT** The local scale factor of a non-linear map.

APPLICATIONS

$x_i = \frac{\det(A_i)}{\det(A)}$	**CRAMER'S RULE** A_i is A with column i replaced by $\mathbf{b}$.
$W(f_1, \ldots, f_n)(x)$	**THE WRONSKIAN** A determinant of functions and their derivatives, at x.
$\prod_{i<j}(x_j - x_i)$	**THE VANDERMONDE PRODUCT** One factor for every pair with i below j.
D_n	**D SUB N** Determinant of the $n \times n$ matrix in a recurrence.

SAME MARKS, DIFFERENT JOB

$\lvert A\rvert$ vs $\lvert x\rvert$	Bars around a matrix give its determinant, which can be negative; around a number, its absolute value.
$\lVert A\rVert$	Double bars are a matrix norm, not the absolute value of $\det A$; that is $\lvert\det(A)\rvert$.
A_i	In Cramer's rule a whole matrix, not a row, column or entry.