Determinant Properties

Mathematics

How row operations and products change a determinant.

A is square. Every row here has a column twin.

Operation	Effect on det(A)
Swap two rows	The sign flips
Scale a row by k	Multiplied by k
Add a multiple of another row	Unchanged
Transpose the matrix	Unchanged
Product AB	det(A) · det(B)
Inverse	1 / det(A)
Triangular matrix	Product of the diagonal

det(A) = 0 exactly when A is singular: the columns are dependent, the map collapses volume, and Ax = b has no unique solution.