Matrix Determinants

Why

Definition

Let $A \in \mathsf{R}^{d \times d}$. The determinant of A is

$$\sum_{\sigma \in S_n} \left(\mathrm{sgn}(\sigma) \prod_{i=1}^{n} a_{i,\sigma_i} \right)$$

We denote the determinant of A by $\det A$.

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[1]Future editions will include, and will probably take the genetic approach via volumes in three-dimensional space.

Matrix Determinants

Real Matrices

Linear Equations

Real Vectors — Linear Functions

Plane Vector Sums and Differences — Space Vectors — N-Dimensional Space

Plane Vectors

Distance

Space Distance — Arrays

Plane Distance

Interval Length

Real Space — Intervals

Real Plane — Real Line

Geometry — Integral Line — Real Order — Real Summation

Real Numbers — Permutations — Rational Order

Rational Numbers — Groups

Integer Arithmetic

Lists — Integer Products

Direct Products

Natural Additive Identity — Natural Multiplicative Identity — Set Numbers

Identity Elements — Arithmetic — Finite Sets — Integer Additive Inverse

Natural Summation — Inverse Elements — Equivalent Sets — Integer Sums — Natural Powers

Family Unions and Intersections — Family Operations — Element Functions — Comparisons — Function Inverses — Integer Order — Natural Products — Natural Equations

Families — Operations — Function Image — Function Composites — Orders — Integer Numbers — Natural Sums — Equations

Converse Relations — Functions — Equivalence Relations — Natural Order — Recursion Theorem

Relations — Peano Axioms

Set Products — Natural Induction

Generalized Set Dualities — Set Powers — Natural Numbers

Set Unions and Intersections — Intersection of Empty Set — Unordered Triples — Partitions — Successor Sets — Set Dualities — Set Symmetric Differences

Ordered Pairs — Set Intersections — Pair Unions — Set Complements

Pair Intersections — Set Unions — Set Differences

Unordered Pairs — Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets — Identities

Names

Letters — Objects