Why

If we view a matrix as a list of vectors, its columns, then we can define matrix-matrix multiplication naturally.

Real Matrix-Matrix Products

Real Matrix-Vector Products

Real Linear Combinations • Vectors As Matrices

Real Vectors • Real Matrices

Linear Equations

Linear Functions

Arrays

N-Dimensional Space

Distance

Space Distance

Plane Distance

Interval Length

Intervals

Real Space

Real Line • Real Plane

Integral Line • Real Order • Real Summation

Geometry • Rational Order • Real Numbers

Rational Numbers

Integer Arithmetic

Integer Products • Natural Multiplicative Identity • Natural Additive Identity

Arithmetic • Identity Elements

Natural Summation

Natural Powers

Lists

Set Numbers

Finite Sets

Family Operations • Equivalent Sets • Direct Products

Natural Equations • Natural Products • Integer Sums • Integer Order • Comparison • Algebra • Function Inverses • Family Unions and Intersections

Equation • Natural Sums • Integer Numbers • Orders • Operations • Function Image • Function Composites • Families

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

Peano Axioms

Relations

Natural Induction

Set Products

Natural Numbers • Set Powers • Generalized Set Dualities

Partitions • Intersection of Empty Set • Successor Sets • Unordered Triples • Set Dualities • Set Unions and Intersections

Set Intersections • Pair Unions • Ordered Pairs • Set Complements

Set Differences • Set Unions • Pair Intersections

Unordered Pairs • Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets • Identities

Names

Letters • Objects

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