Why

Permutations of the set $\{1, 2, \ldots, n\}$ correspond to matrices over N.

Definition

The *matrix* corresponding to a permutation of $\{1, 2, \ldots, n\}$ is a matrix of natural numbers whose i, jth element is 1 if the permutation maps i to j; for $i, j \in \{1, 2, \ldots, n\}$.

Notation

Let $\sigma : \{1, 2, \ldots, n\} \to \{1, 2, \ldots, n\}$ be a permutation. Let $M \in \mathsf{N}^{n \times n}$ be such that M_{ij} is one if $\sigma(i) = j$ and 0 otherwise. Then M is the permutation matrix of σ.

Permutation Matrices

Matrices

Permutations

Vectors

N-Dimensional Space

Fields

Space

Real Numbers

Groups

Function Inverses

Rational Numbers

Algebras

Function Composites

Function Images

Integer Numbers

Operations

Functions

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Cartesian Products

Set Powers

Ordered Pairs

Zero

Unordered Triples

Natural Numbers

Pair Unions

Set Intersections

Set Unions

Pair Intersections

Empty Set

Unordered Pairs

Equation Solutions

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Logical Statements

Statements

Identities

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Names

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