Definition

A square real matrix is *symmetric* (we call it a a *symmetric matrix*) if its values do not depend on the order of the indices. In other words, a matrix is symmetric if the values above and below the diagonal are a mirror image.

Examples

The matrix

$$\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$$

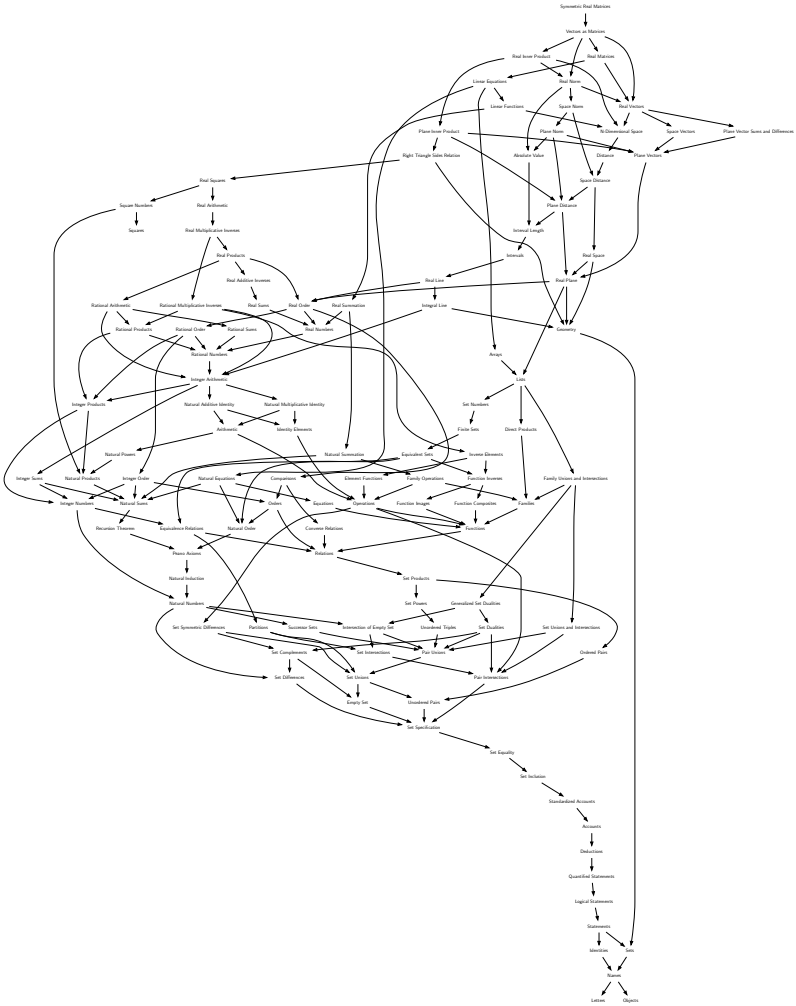
is symmetric. The matrix

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

is not.

Notation

$A \in \mathbf{R}^{n \times n}$ is symmetric means $A^\top = A$.


Symmetric Real Matrices
Vectors as Matrices
Real Matrices
Real Inner Product
Linear Equations
Real Norm
Real Vectors
Linear Functions
Space Norm
N-Dimensional Space
Space Vectors
Plane Vector Sums and Differences
Plane Inner Product
Plane Norm
Plane Vectors
Right Triangle Sides Relation
Absolute Value
Distance
Space Distance
Real Squares
Square Numbers
Real Arithmetic
Squares
Plane Distance
Real Multiplication Inverses
Interval Length
Real Products
Intervals
Real Space
Real Addition Inverses
Real Line
Real Plane
Rational Arithmetic
Rational Multiplication Inverses
Real Sums
Real Order
Real Summation
Integral Line
Geometry
Rational Products
Rational Order
Rational Sums
Real Numbers
Rational Numbers
Arrays
Units
Integer Arithmetic
Set Numbers
Integer Products
Natural Addition Identity
Natural Multiplication Identity
Finite Sets
Direct Products
Arithmetic
Identity Elements
Natural Powers
Natural Summation
Equivalent Sets
Inverse Elements
Integer Sums
Natural Products
Integer Order
Natural Equation
Comparisons
Element Functions
Family Operations
Function Inverses
Family Unions and Intersections
Integer Numbers
Natural Sums
Order
Equations
Operations
Function Images
Function Composites
Families
Recursion Theorem
Equivalence Relations
Natural Order
Concrete Relations
Functions
Peano Axioms
Relations
Natural Induction
Set Products
Natural Numbers
Set Powers
Generalized Set Dualities
Set Symmetric Differences
Partitions
Successor Sets
Intersection of Empty Set
Unordered Triples
Set Dualities
Set Unions and Intersections
Set Complements
Set Intersections
Set Unions
Ordered Pairs
Set Differences
Pair Intersections
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Reason
Letters
Objects