Why

[1]

Definition

An *orthonormal* (or *orthogonal*) matrix is a matrix whose columns are an orthonormal family of vectors.

Some authors call these *real orthogonal* or *unitary* matrices.

Notation

Let $A \in \mathsf{F}^{m \times n}$. Something something

$$AA^\top = I.$$

Characterizations

Proposition 1. *A matrix is orthonormal if and only if its transpose product with the matrix is the identity.*

Proposition 2. *A matrix is orthonormal if and only if its transpose is orthonormal.*

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[1]Future editions will include.

Orthonormal Matrices

Orthonormal Vectors — Matrix Transpose

Inner Product Norms — Matrices

Norms — Inner Products

Functionals

Vectors

Absolute Value — N-Dimensional Space

Real Square Roots — Distance

Real Squares — Space Distance

Real Arithmetic — Plane Distance

Real Multiplicative Inverses

Real Products — Interval Length

Real Additive Inverses — Intervals

Rational Arithmetic — Real Sums — Rational Multiplicative Inverses — Real Line — Real Plane — Real Space

Rational Products — Rational Sums — Real Numbers — Real Order — Integral Line

Rational Number — Fields — Geometry

Groups

Integer Arithmetic — Integer Additive Inverses — Sequences

Integer Products — Integer Sums — Natural Additive Identity — Natural Multiplicative Identity — Inverse Elements — Set Numbers

Natural Square Roots — Integer Numbers — Arithmetic — Identity Elements — Element Functions — Finite Sets

Square Numbers — Natural Powers — Algebras — Equivalent Sets — Direct Products

Squares — Natural Products — Natural Equations — Operations — Function Inverse — Family Unions and Intersections

Natural Sums — Natural Order — Equations — Function Composites — Function Images — Families

Recursion Theorem — Functions — Equivalence Relations

Peano Axioms — Relations

Natural Induction — Cartesian Products

Natural Numbers — Set Powers — Generalized Set Dualities

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

Ordered Pairs — Set Complements — Pair Unions — Set Intersections

Set Differences — Set Unions — Pair Intersections

Unordered Pairs — Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities — Sets

Names

Letters — Objects

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