Definition

A vector is *normalized* if its norm is 1. A set of vectors $\{u_1, \ldots, u_k\}$ *orthogonal* if $u_i^\top u_j = 0$ whenever $i \neq j$. A set of vectors is *orthonormal* if the set is orthogonal and each vector is normalized.

Basis

An orthonormal set of vectors is also an independent set. In other words, orthonormality is stronger than independence.

Orthonormal Set of Real Vectors

Real Inner Product

Real Norm

Space Norm

Real Vectors

Plane Inner Product

Plane Norm

Space Vectors

Plane Vector Sums and Differences

N-Dimensional Space

Right Triangle Sides Relation

Absolute Value

Plane Vectors

Distance

Real Square

Space Distance

Real Arithmetic

Plane Distance

Real Multiplicative Inverse

Interval Length

Real Products

Square Numbers

Intervals

Real Space

Real Additive Inverse

Real Line

Real Plane

Rational Multiplicative Inverse

Rational Arithmetic

Real Sums

Real Order

Squares

Integral Line

Rational Products

Rational Sums

Real Numbers

Rational Order

Geometry

Integer Arithmetic

Rational Numbers

Natural Multiplicative Identity

Natural Additive Identity

Integer Products

Lists

Identity Elements

Arithmetic

Set Numbers

Inverse Elements

Natural Powers

Equivalent Sets

Finite Sets

Direct Products

Element Functions

Integer Sums

Natural Products

Integer Order

Comparisons

Family Unions and Intersections

Operations

Function Composite

Function Images

Integer Numbers

Natural Sums

Orders

Families

Functions

Equivalence Relations

Converse Relations

Recursion Theorem

Natural Order

Function Inverse

Relations

Peano Axioms

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

Ordered Pairs

Set Intersections

Pair Unions

Set Differences

Set Unions

Pair Intersections

Empty Set

Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects