Why

We want to convert a subset of a vector space into a subspace.

Definition

The *span* of a subset of a vector space is the intersection of all subspaces which contain that subset. Since the intersection of a family of subspaces is a subspace, so too is the span. Indeed, the span of a subset is contained in every subspace containing the set.

A subset of a vector space *spans* a subspace if its span is that subspace. For example, the subspace may be a vector space, in which case the subset spans the entire space. In this case we say that the subset *spans the space*.

Notation

We denote

Examples

Prop. 1. *The empty set is contained in every subspace, so the span of the empty set is the zero vector space.*

If S is a

Span

Subspaces

Vectors

N-Dimensional Space

Distance

Space Distance

Plane Distance

Interval Length

Intervals

Real Plane   Real Line   Real Space

Integral Line   Real Order

Geometry   Real Numbers

Fields

Rational Numbers   Groups

Sequences   Integer Arithmetic   Integer Additive Inverse

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

Direct Products   Finite Sets   Identity Elements   Arithmetic   Element Functions

Equivalent Sets   Algebras   Natural Powers   Integer Products

Family Unions and Intersections   Operations   Function Inverse   Natural Products   Integer Numbers

Families   Equivalence Relations   Function Composites   Function Images   Natural Sums

Natural Order   Functions   Recursion Theorem

Relations   Peano Axioms

Cartesian Products   Natural Induction

Generalized Set Dualities   Set Powers   Natural Numbers

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

Set Complements   Pair Unions   Set Intersections   Ordered Pairs

Pair Intersections   Set Unions   Set Differences

Empty Set   Unordered Pairs

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets   Identities

Names

Letters   Objects

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