Why

A point in $\mathbf{R}^n$ is also called a vector in $\mathbf{R}^n$, since R^n with the usual operations of element-wise addition and element-wise scalar multiplication is a vector space.

Result

For $x, y \in \mathbf{R}^n$, define $x + y$ by

$$(x_1 + y_1, \ldots, x_n + y_n)$$

and for $\alpha \in \mathbf{R}$, define $\alpha \cdot x$

$$(\alpha x_1, \ldots, \alpha x_n).$$

Proposition 1. $\mathbf{R}^n$ *is a vector space of dimension* n *over* $\mathbf{R}$ *with* $+$ *and* $\cdot$.

For this reason, we call elements of $\mathbf{R}^n$ *(real) vectors.*


Real Vectors
Vectors
N-Dimensional Space
Distance
Space Distance
Plane Distance
Interval Length
Intervals
Real Space
Real Line
Real Plane
Integral Line
Real Order
Geometry
Real Numbers
Fields
Groups
Rational Numbers
Sequences
Integer Additive Inverses
Integer Arithmetic
Set Numbers
Inverse Elements
Integer Sums
Natural Multiplicative Identity
Natural Additive Identity
Direct Products
Finite Sets
Element Functions
Identity Elements
Arithmetic
Equivalent Sets
Algebras
Natural Powers
Integer Products
Family Unions and Intersections
Function Inverses
Operations
Integer Numbers
Natural Products
Families
Equivalence Relations
Function Composites
Function Images
Natural Sums
Functions
Natural Order
Recursion Theorem
Relations
Peano Axioms
Set Products
Natural Induction
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Partitions
Intersection of Empty Set
Set Dualities
Unordered Triples
Successor Sets
Set Intersections
Pair Unions
Set Complements
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
Identities
Sets
Names
Letters
Objects