Definition

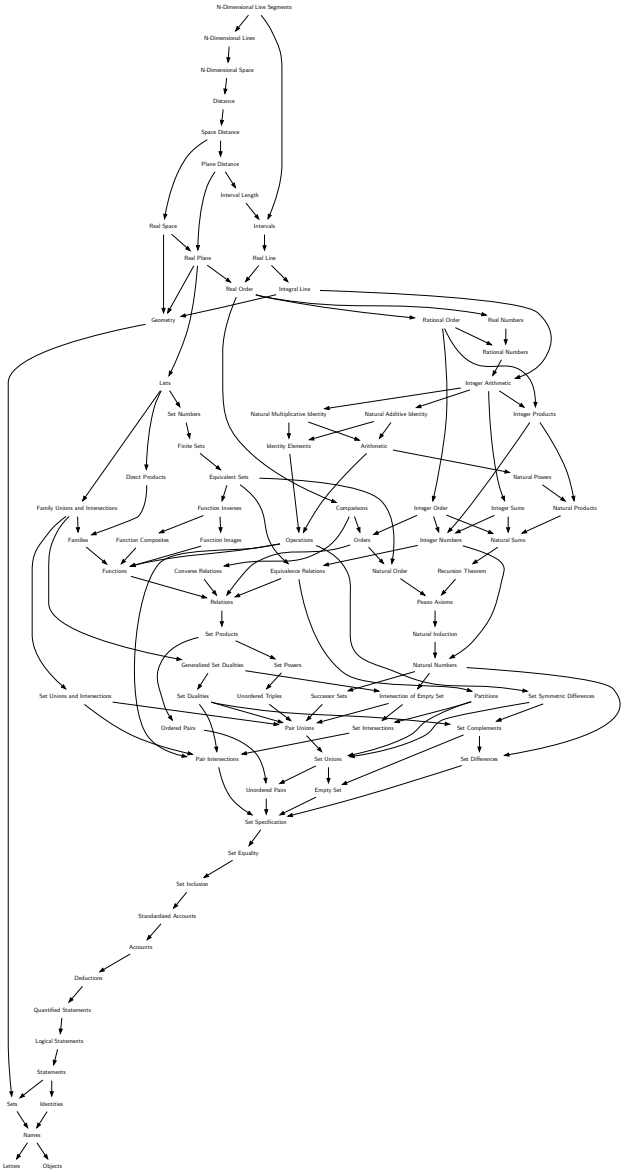
The *closed line segment between* two points in n-dimensional space is the set of points which can be expressed as the sum of the first point and a scalar multiple of the difference between the second point and the first; where the scalar is in the interval $[0, 1]$. Thus, the closed line segment between two points is a subset of the line though the two points. The *open line segment* between x and y is the closed line segment with the points x and y.

Notation

The closed line segment between $x, y \in \mathbf{R}^n$ is the set

$$\{z \in \mathbf{R}^n \mid z = x + a(y - x), 0 \leq a \leq 1, x, y \in \mathbf{R}^n\}.$$

Notice that $x + a(y - x) = (1 - a)x + ay$.


N-Dimensional Line Segments
N-Dimensional Lines
N-Dimensional Space
Distance
Space Distance
Plane Distance
Interval Length
Real Space
Intervals
Real Plane
Real Line
Real Order
Integral Line
Geometry
Rational Order
Real Numbers
Rational Numbers
Integer Arithmetic
Lists
Set Numbers
Natural Multiplicative Identity
Natural Additive Identity
Integer Products
Finite Sets
Identity Elements
Arithmetic
Natural Powers
Direct Products
Equivalent Sets
Comparisons
Integer Order
Integer Sums
Natural Products
Family Unions and Intersections
Function Inverses
Families
Function Composites
Function Images
Operations
Order
Integer Numbers
Natural Sums
Functions
Converse Relations
Equivalence Relations
Natural Order
Recursion Theorem
Relations
Peano Axioms
Set Products
Natural Induction
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Set Dualities
Unordered Triples
Successor Sets
Intersection of Empty Set
Partitions
Set Symmetric Differences
Ordered Pairs
Pair Unions
Set Intersections
Set Complements
Pair Intersections
Set Unions
Set Difference
Unordered Pairs
Empty Set
Set Specification
Set Equality
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects