Why

We want to generalize rectangles and cubes to n-dimensional space.

Definition

Let $I : \{1, 2, \ldots, d\} \to \mathbf{R}$ be a family of d intervals. A *hyperrectangle* is the set $\prod_{i=1}^{d} I_i$.[1]

As a result of this definition, an interval, a rectangle, and a cube are all hyperrectangles. Of course, in our definition we include four, five, and "dimensional" rectangles.

As with intervals, rectangles, and cubes, we call a hyperrectangle open, closed, left-open, right-open accordingly.

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[1]Some authors use the term rectangle or *n-dimensional rectangle*. Some authors use the term *box* or *n-box*.

Hyperrectangles

N-Dimensional Space

Distance

Space Distance

Plane Distance

Cubes

Interval Length

Rectangles

Intervals

Real Space

Real Line

Real Plane

Integral Line

Real Order

Rational Order

Real Numbers

Geometry

Rational Numbers

Integer Arithmetic

Lists

Integer Products

Natural Multiplicative Identity

Natural Additive Identity

Set Numbers

Arithmetic

Identity Elements

Finite Sets

Direct Products

Natural Powers

Operations

Equivalent Sets

Integer Sums

Natural Products

Integer Order

Comparisons

Function Inverses

Family Unions and Intersections

Integer Numbers

Natural Sums

Orders

Function Composites

Function Images

Families

Recursion Theorem

Natural Order

Equivalence Relations

Converse Relations

Functions

Peano Axioms

Relations

Natural Induction

Set Products

Natural Numbers

Set Powers

Generalized Set Dualities

Partitions

Successor Sets

Intersection of Empty Set

Unordered Triples

Set Dualities

Set Unions and Intersections

Set Intersections

Pair Unions

Ordered Pairs

Set Complements

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