Why

We represent rectangles by functions.

Definition

A *rectangular function* corresponds to a characterstic function of an interval. It represents a rectangle whose width is the interval and whose height is one.

Notation

Let A be a non-empty set and $B \subset A$. Recall that we denote the characteristic function of B by χ_B.

Now suppose that $A \subset \mathbf{R}$. If we embed $\{0, 1\} = 2 \in \mathbf{N}$ in $\mathbf{R}$ by associating 0 to $0_{\mathbf{R}}$ and 1 to $1_{\mathbf{R}}$ then every characteristic function is identified with a function from $\mathbf{R}$ to $\mathbf{R}$.

In particular, notice that if B is an interval and α is a real number then $\alpha\chi_B$ is a rectangle with height α.

Rectangular Functions

Rectangles · Real Functions

Intervals

Real Plane · Real Line

Real Order · Integral Line

Rational Order · Real Numbers · Geometry

Rational Numbers

Lists · Integer Arithmetic

Set Numbers · Integer Products · Natural Additive Identity · Natural Multiplicative Identity

Finite Sets · Arithmetic · Identity Elements

Direct Products · Equivalent Sets · Natural Powers

Family Unions and Intersections · Function Inverses · Comparisons · Integer Order · Integer Sums · Natural Products

Families · Function Composites · Function Images · Orders · Integer Numbers · Natural Sums · Operations

Functions · Converse Relations · Equivalence Relations · Natural Order · Recursion Theorem

Relations · Peano Axioms

Characteristic Functions · Set Products · Natural Induction

Set Powers · Generalized Set Dualities · Natural Numbers

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

Pair Unions · Set Intersections · Ordered Pairs · Set Complements

Pair Intersections · Set Unions · Set Differences

Unordered Pairs · Empty Set

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities · Sets

Names

Letters · Objects