Why

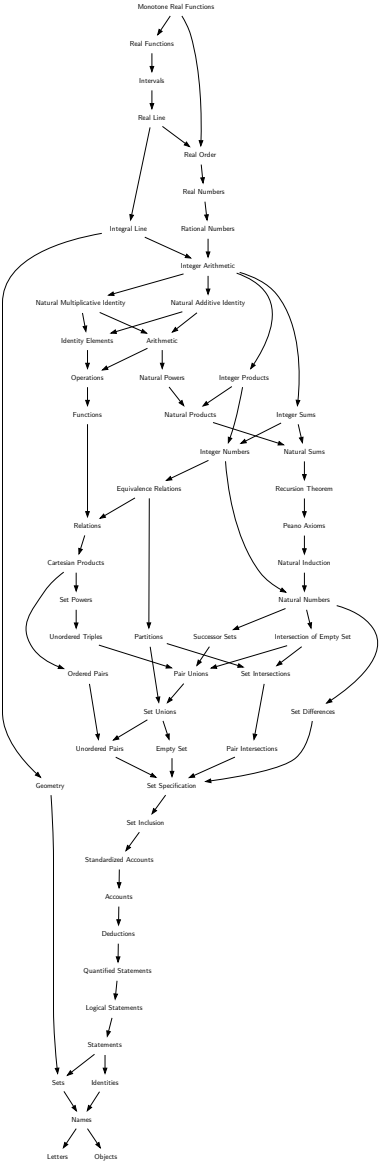
We can interpret a real function as tracing a path as we move from left to right in its domain.[1] We want language for whether this tracing increases or decreases the range values.

Definition

Let $A \subset \mathbf{R}$ and let $f : A \to \mathbf{R}$. A function is *monotone increasing* if $f(x) < f(y)$ whenever $x < y$, and *monotone nondecreasing* if $f(x) \leq f(y)$ whenever $x, y \in \mathbf{R}$ and $x < y$.[2] Similarly we define *monotone decreasing* and *monotone nonincreasing*.

[1] Future editions will likely have this interpretation in a separate sheet.

[2] Unforunately, some authors use "monotone increasing" for "monotone nondecreasing" and use the terminolgy *strictly monotone increasing* for "monotone increasing".


Monotone Real Functions
Real Functions
Intervals
Real Line
Real Order
Real Numbers
Integral Line
Rational Numbers
Integer Arithmetic
Natural Multiplicative Identity
Natural Additive Identity
Identity Elements
Arithmetic
Operations
Natural Powers
Integer Products
Functions
Natural Products
Integer Sums
Integer Numbers
Natural Sums
Equivalence Relations
Recursion Theorem
Relations
Peano Axioms
Cartesian Products
Natural Induction
Set Powers
Natural Numbers
Unordered Triples
Partitions
Successor Sets
Intersection of Empty Set
Ordered Pairs
Pair Unions
Set Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Pair Intersections
Geometry
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects