Real Functions

Why

We name functions whose domain is the real numbers.

Definition

A *real function* is a real-valued function The domain is often an interval of real numbers, but may be any non-empty set.

Notation

$f : \mathsf{R} \to \mathsf{R}$. f is a real function. To speak of functions defined on intervals, let $a, b \in \mathsf{R}$. $g : [a, b] \to \mathsf{R}$. is a real function defined on a closed interval. $h : (a, b) \to \mathsf{R}$ is a real function defined on an open interval.

We regularly declare the interval and the function in one pass: Let $f : [a, b] \to \mathsf{R}$, read aloud as "$f$ from closed a b to R." Or, let $f : (a, b) \to \mathsf{R}$ read aloud as "f from open a b to R".

Examples

Example 1. *Let $c \in \mathsf{R}$. Let $f : \mathsf{R} \to \mathsf{R}$ be such that $f(x) = c$ for every $x \in \mathsf{R}$. f is a real function.*

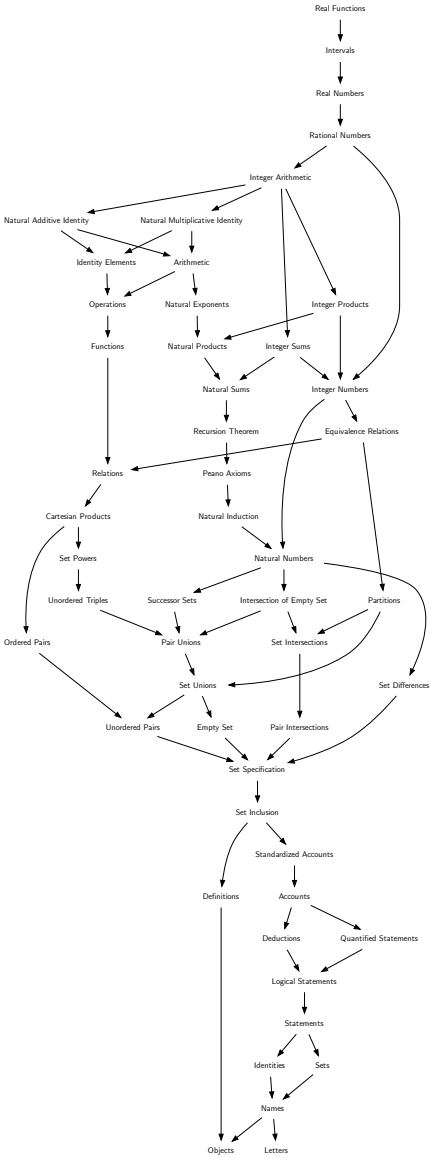
Example 2.

Let $f : \mathsf{R} to \mathsf{R}$ with $f(x) = 2x^2 + 1$ for all $x \in R$. f is a real function.

Example 3. *Let* $f : \mathsf{R} \to \mathsf{R}$ *with*

$$f(x) = \begin{cases} 1 & \textit{if } x \in \mathsf{Q} \\ 0 & \textit{otherwise.} \end{cases}$$

f *is a real function.*


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