Why

We are frequently interested in finding minimizers of real functions.[1]

Definition

An *optimization problem* is a pair $(\mathcal{X}, f : \mathcal{X} \to \mathbf{R})$. We call $\mathcal{X}$ the *constraint set* and f the *objective* (or *cost function*).

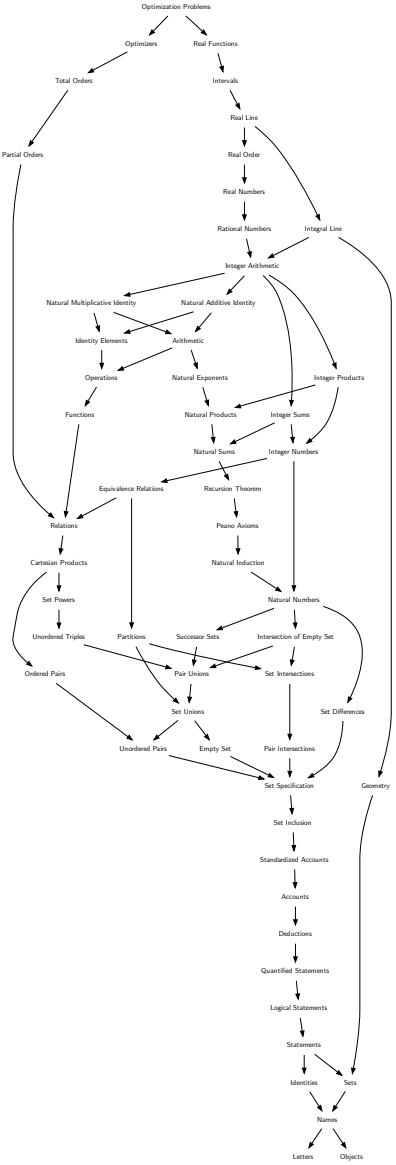
Notation

We often write optimization problems as

$$\begin{aligned} &\text{minimize } f(x) \\ &\text{subject to } x \in \mathcal{X}. \end{aligned}$$

In this case we call x the *decision variable*.

[1] Future editions will modify.


Optimization Problems
Optimizers
Real Functions
Total Orders
Intervals
Real Line
Partial Orders
Real Order
Real Numbers
Rational Numbers
Integral Line
Integer Arithmetic
Natural Multiplicative Identity
Natural Additive Identity
Identity Elements
Arithmetic
Operations
Natural Exponents
Integer Products
Functions
Natural Products
Integer Sums
Natural Sums
Integer Numbers
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
Set Specification
Geometry
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects