Why

We want to solve equations with squares.

Definition

Let b be any real number. We want to find a to solve

$$a^2 = b.$$

We call a solution a a *square root* of b.

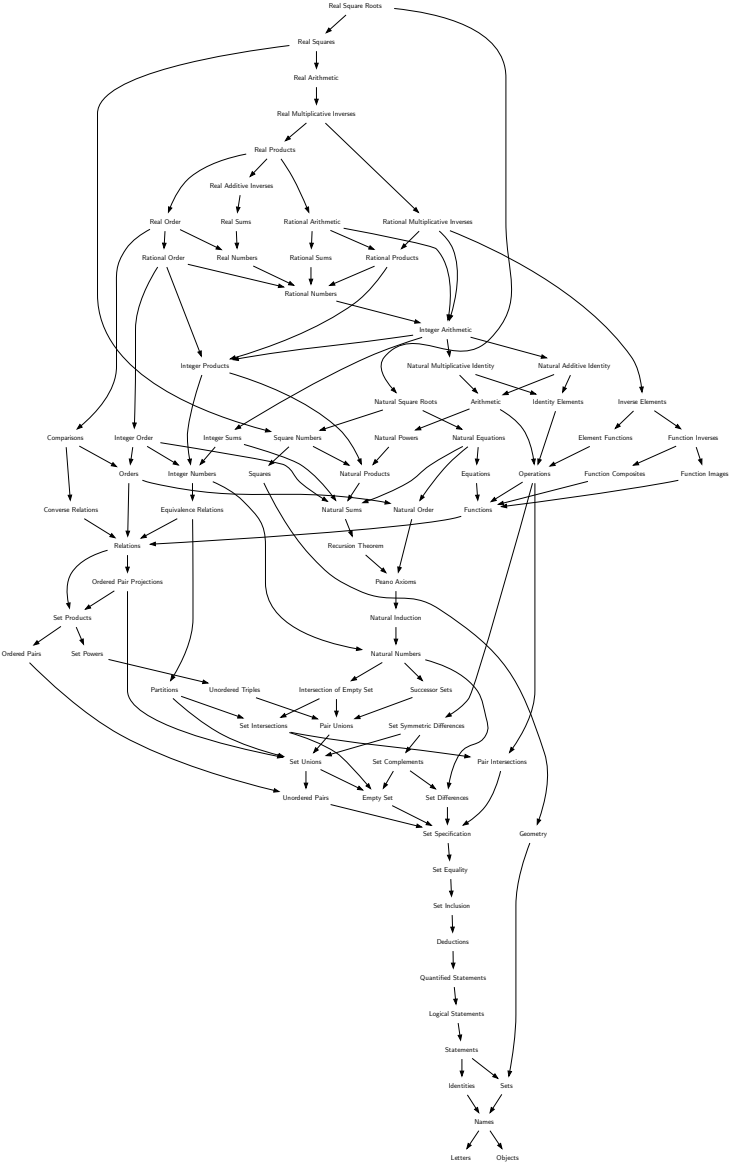
Proposition 1. *A positive real number has two square roots.*

Despite the above proposition, we still speak of *the square root* of a real number, which is the positive square root. We also speak of the *square root function* which associates a real number to its positive square root.

Proposition 2. *A two roots or a positive real number are additive inverses.*

Notation

As with natural numbers, we denote *the* (positive) square root of the real number $x \in \mathbf{R}$ by $\sqrt{x}$. Some authors refer to both the roots of x by writing $\pm\sqrt{x}$.


Real Square Roots
Real Squares
Real Arithmetic
Real Multiplicative Inverses
Real Products
Real Additive Inverses
Real Order
Real Sums
Rational Arithmetic
Rational Multiplicative Inverses
Rational Order
Real Numbers
Rational Sums
Rational Products
Rational Numbers
Integer Arithmetic
Integer Products
Natural Multiplicative Identity
Natural Additive Identity
Natural Square Roots
Arithmetic
Identity Elements
Inverse Elements
Comparisons
Integer Order
Integer Sums
Square Numbers
Natural Powers
Natural Equations
Element Functions
Function Inverses
Orders
Integer Numbers
Squares
Natural Products
Equations
Operations
Function Composites
Function Images
Converse Relations
Equivalence Relations
Natural Sums
Natural Order
Functions
Relations
Recursion Theorem
Ordered Pair Projections
Peano Axioms
Set Products
Natural Induction
Ordered Pairs
Set Powers
Natural Numbers
Partitions
Unordered Triples
Intersection of Empty Set
Successor Sets
Set Intersections
Pair Unions
Set Symmetric Differences
Pair Intersections
Set Unions
Set Complements
Unordered Pairs
Empty Set
Set Differences
Set Specification
Geometry
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects