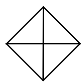


Why

We are constantly thinking of the real numbers as the points of a line.[1]

Discussion

We commonly associate elements of the real numbers (see Real Numbers) with points on a line (see Geometry).

Principle 1 (Point Sets)**.** *Given a line, there exists a set of its (infinite) points.*

Principle 2 (Real Line Correspondence)**.** *Let P be the set of points for a line. There exists a one-to-one correspondence mapping elements of P onto elements of R.*

For this reason, we sometimes call elements of the real numbers *points*. We call the point associated with 0 the *origin*.

Visualization

To visualize the correspondence we draw a line. We then associate a point of the line with the $0 \in \mathsf{R}$. We can label it so. We then pick a unit length. We associate the points a unit length away from zero with $1 \in \mathsf{R}$ (on the right) and $-1 \in \mathsf{R}$ (on the left). We do the same for two and 2 and -2, 3 and -3, and then we say that we could continue the process indefinitely. We can visualize the image in Figure 1.

[1] Future editions will modify this sheet.

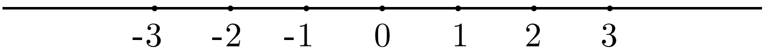
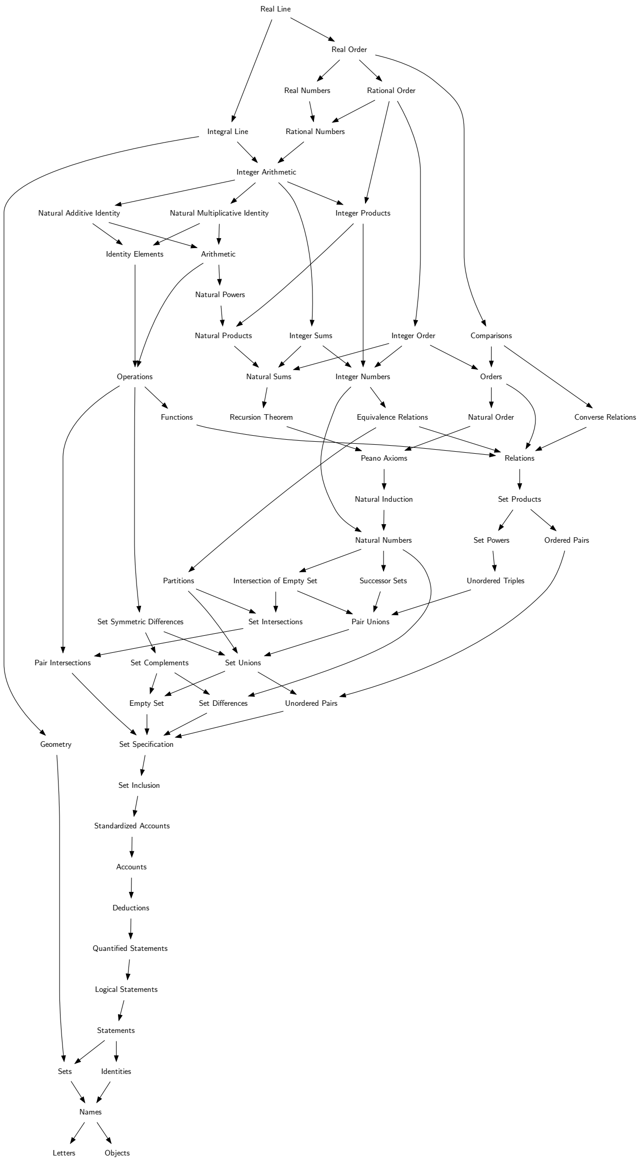


Figure 1: The real line


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