Why

We want to extend addition to $\mathbf{C}$.

Let $z_1, z_2 \in \mathbf{C}$ with $z_1 = (x_1, y_1)$ and $z_2 = (x_2, y_2)$. The *complex sum* of z_1 and z_2 is the complex number $(x_1 + x_2, y_1 + y_2)$.

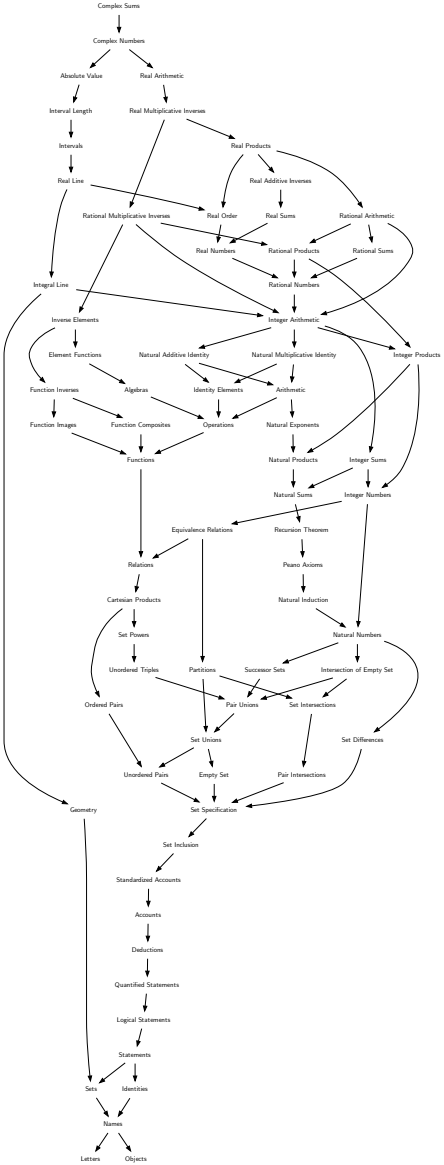
Notation

For $z_1, z_2 \in \mathbf{C}$, we denote the complex sum of z_1 and z_2 by $z_1 + z_2$. The notation is justified because the complex sum of two purely real complex numbers corresponds to the purely real complex numbers whose real part is the real sum of the real parts of the first two numbers.

Recall that we denote $z_1 = x_1 + iy_1$ and $z_2 = x_2 + iy_2$. For example, we can express the definition of addition as

$$z_1 + z_2 = (x_1 + x_2) + i(y_1 + y_2)$$

and multiplication is


Complex Sums
Complex Numbers
Absolute Value
Real Arithmetic
Interval Length
Real Multiplicative Inverses
Intervals
Real Products
Real Line
Real Additive Inverses
Rational Multiplicative Inverses
Real Order
Real Sums
Rational Arithmetic
Real Numbers
Rational Products
Rational Sums
Integral Line
Rational Numbers
Inverse Elements
Integer Arithmetic
Element Functions
Natural Additive Identity
Natural Multiplicative Identity
Integer Products
Function Inverses
Algebras
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Arithmetic
Function Images
Function Composites
Operations
Natural Exponents
Functions
Natural Products
Integer Sums
Natural Sums
Integer Numbers
Equivalence Relations
Recursion Theorem
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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
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Statements
Sets
Identities
Names
Letters
Objects