Why

We want to add and multiply complex numbers.[1]

Definition

Let $z_1, z_2 \in \mathbf{C}$ with $z_1 = (x_1, y_1)$ and $z_2 = (x_2, y_2)$. The *complex product* of z_1 and z_2 is the complex number $(x_1x_2 - y_1y_2, x_1y_2 + y_1x_2)$.

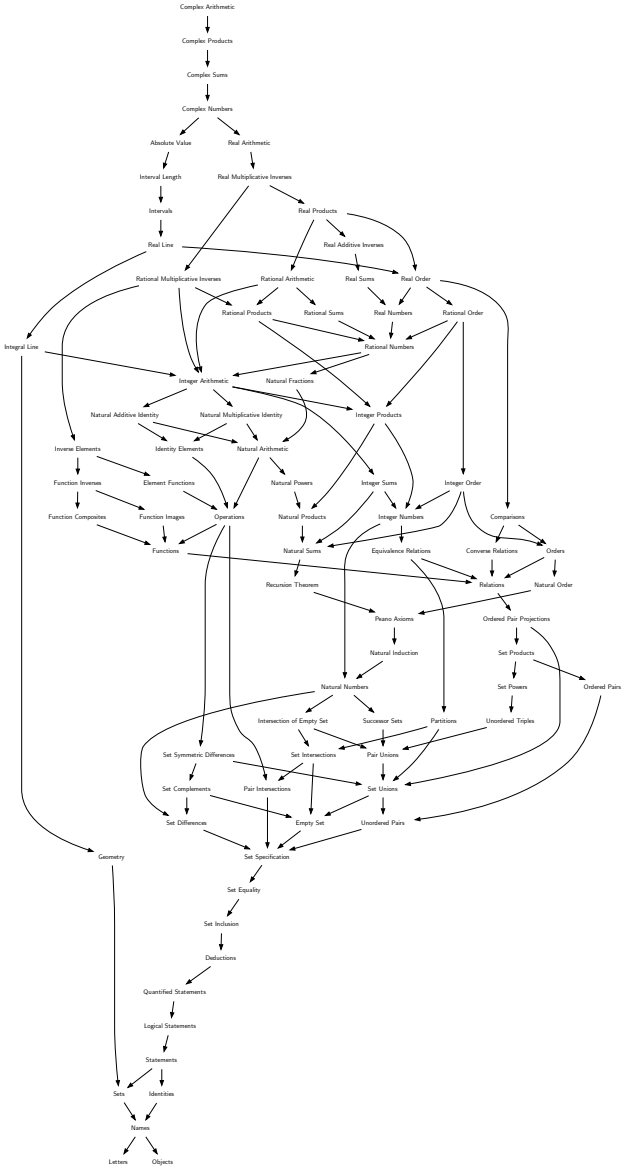
Properties

Proposition 1 (Distributivity)**.** *For all $z_1, z_2, z_3 \in \mathbf{C}$, we have $z_1(z_2+z_3)$ and $z_1z_2 + z_1z_3$*

Relaton to $\mathbf{R}^2$

Addition in $\mathbf{C}$ corresponds to the usual addition of the corresponding vectors in the plane $\mathbf{R}^2$. In other words, it corresponds to element-wise addition. However multiplication in $\mathbf{C}$ is *not* componentwise multiplication in $\mathbf{R}^2$.

[1] Future editions will expand in the genetic account for introducing complex numbers.


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