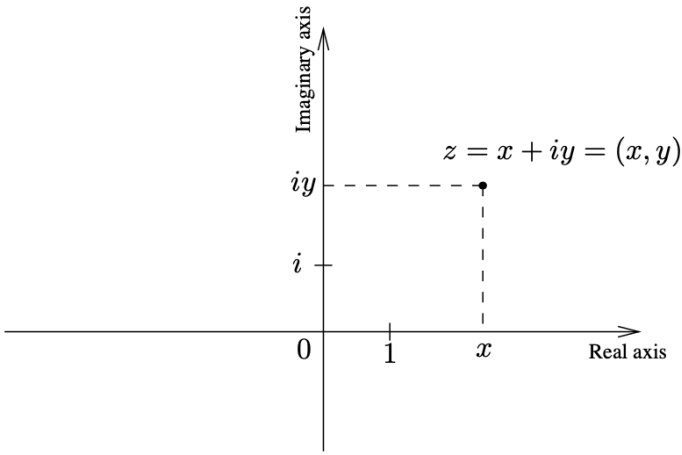
Why

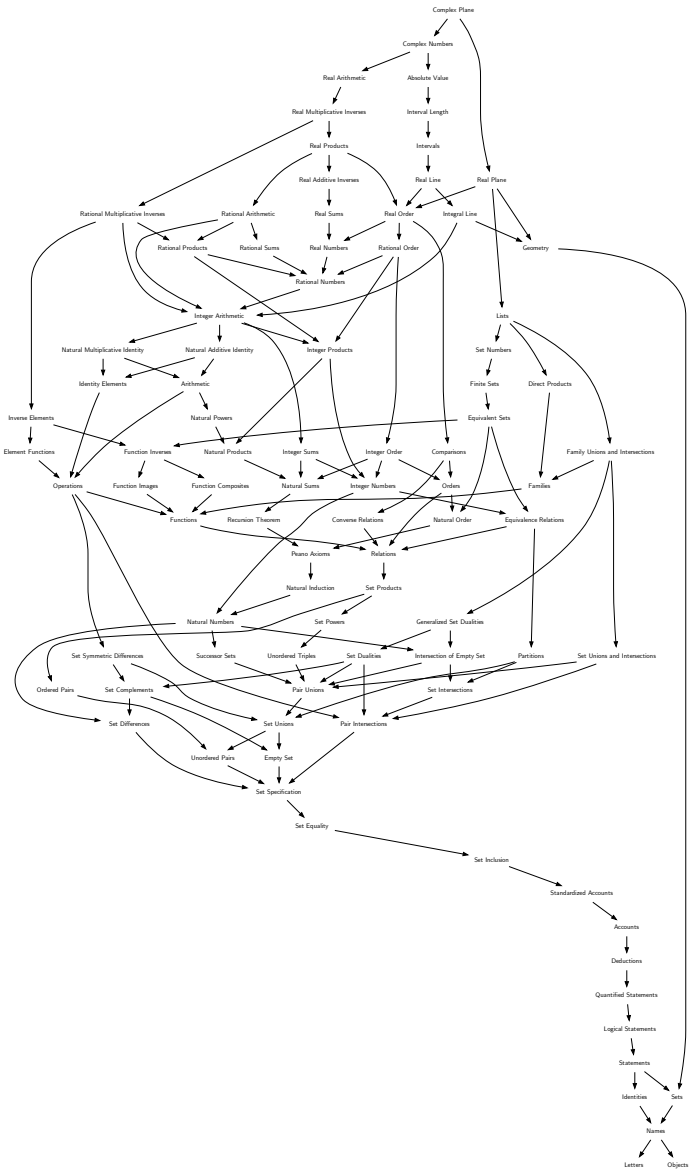
We are regularly thinking of $\mathbf{C}$ as plane.

Definition

Since $\mathbf{C} = \mathbf{R}^2$, we can identify elements of $\mathbf{C}$ with points in the plane (as we did in Real Plane). In this case, if $z = x + iy \in \mathbf{C}$ (i.e, $z = (x, y) \in \mathbf{R}^2$), we can visualize this identification in the following figure.



We can identify the origin with the complex number $(0, 0) = 0 \in \mathbf{C}$. For this reason we call $0 \in \mathbf{C}$ the *complex origin*. Likewise, the imaginary number $(0, 1) = i \in \mathbf{C}$ corresponds to $(0, 1)$ Clearly, the horizontal axis corresponds to the purely real numbers and the vertical axis corresponds to the purely imaginary numbers. For these reasons, we refer to these axes as the *real axis* and *imaginary axis*, respectively. We refer to the above figure as the *complex plane* (or *Argand diagram*).


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