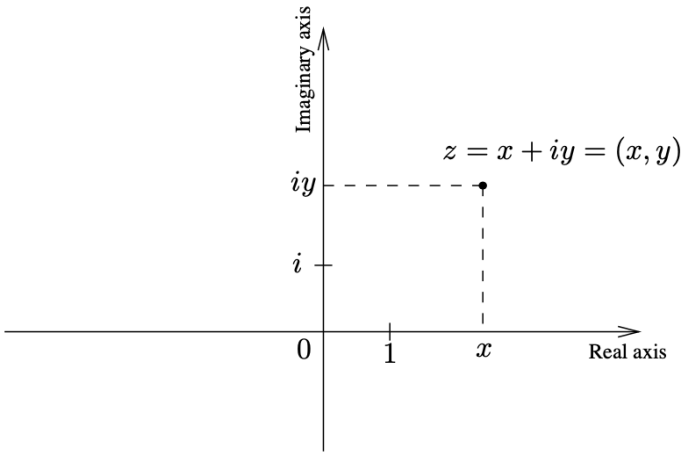
Why

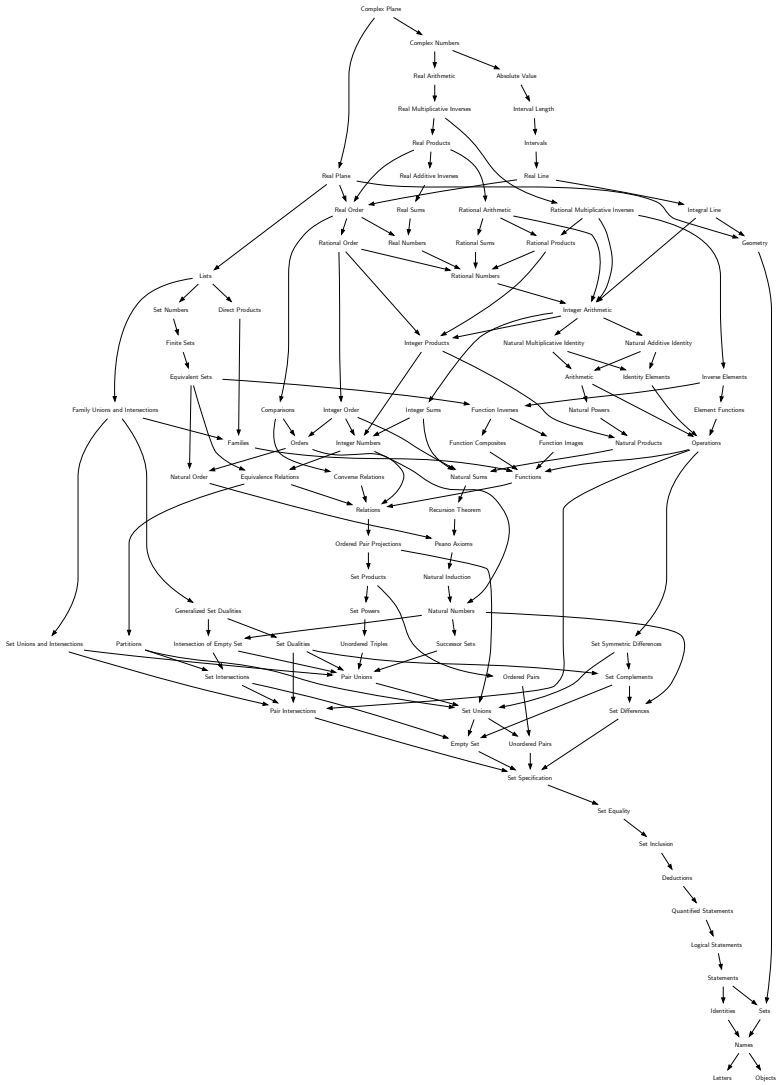
We are regularly thinking of $\mathbf{C}$ as plane.

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