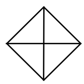


Why

The identification of $\mathbf{C}$ with a plane leads $\mathbf{C}$ to naturally inherit R^2's notion of distance.

Definition

The *absolute value* or *modulus* of $z = (x, y) \in \mathbf{C}$ is the distance of z to the origin. If $z \in \mathbf{C}$, then the modulus of z is

$$\sqrt{x^2 + y^2}.$$

In other words, the modulus of z is the distance (in R^2 of $z = (x, y)$ from the origin $(0, 0)$.

Notation

We denote the modulus of z by $|z|$.

Properties

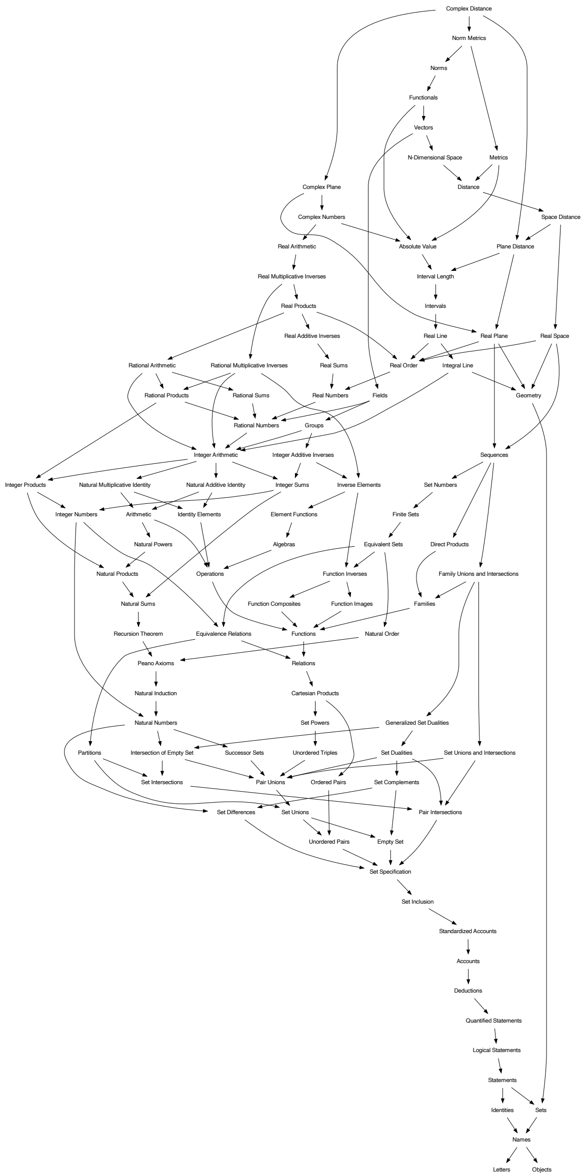
Proposition 1 (Triangle Inequality)**.** *For all $z, w \in \mathbf{C}$,*

$$|z + w| \leq |z| + |w| .$$

Also, for all $z \in \mathbf{C}$, we have $|\mathrm{Re}(z)| \leq |z|$ and $|\mathrm{Im}(z)| \leq |z|$, and for all $z, w \in \mathbf{C}$,

$$||z| - |w|| \leq |z - w| .$$ [1]

[1] This follows from the triangle inequality. Future editions will include an account.



Complex Distance
Norm Metrics
Norms
Functionals
Vectors
N-Dimensional Space
Metrics
Complex Plane
Distance
Complex Numbers
Space Distance
Real Arithmetic
Absolute Value
Plane Distance
Real Multiplicative Inverses
Interval Length
Real Products
Intervals
Real Additive Inverses
Real Line
Real Plane
Real Space
Rational Arithmetic
Rational Multiplicative Inverses
Real Sums
Real Order
Integral Line
Rational Products
Rational Sums
Real Numbers
Fields
Geometry
Rational Numbers
Groups
Integer Arithmetic
Integer Additive Inverses
Sequences
Integer Products
Natural Multiplicative Identity
Natural Additive Identity
Integer Sums
Inverse Elements
Set Numbers
Integer Numbers
Arithmetic
Identity Elements
Element Functions
Finite Sets
Natural Powers
Algebras
Equivalent Sets
Direct Products
Natural Products
Operations
Function Inverses
Family Unions and Intersections
Natural Sums
Function Composites
Function Images
Families
Recursion Theorem
Equivalence Relations
Functions
Natural Order
Peano Axioms
Relations
Natural Induction
Cartesian Products
Natural Numbers
Set Powers
Generalized Set Dualities
Partitions
Intersection of Empty Set
Successor Sets
Unordered Triples
Set Dualities
Set Unions and Intersections
Set Intersections
Pair Unions
Ordered Pairs
Set Complements
Set Differences
Set Unions
Pair Intersections
Unordered Pairs
Empty Set
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects