Why

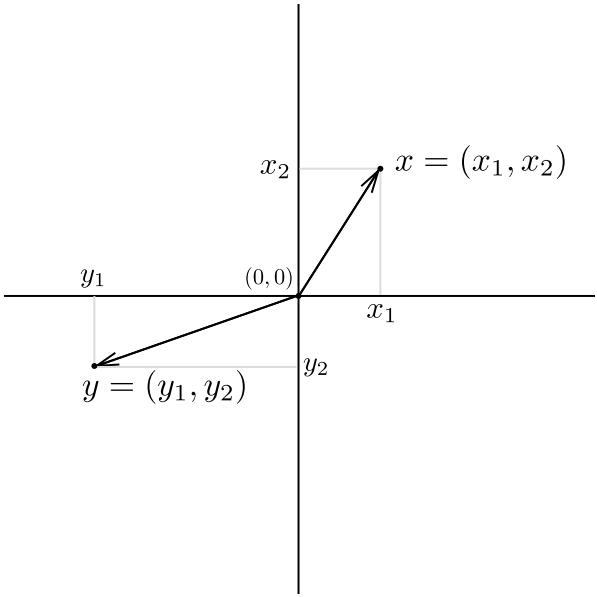
A point in the plane can be *interpreted* as a *displacement*.

Definition

A *plane vector* (or *vector*, *two-dimensional vector*, *2-vector*) is an element of $\mathbf{R}^2$. We associate a list of two numbers with a point in the plane, a *location*. We also associate a list of two numbers with a *displacement*, a *change* in location.

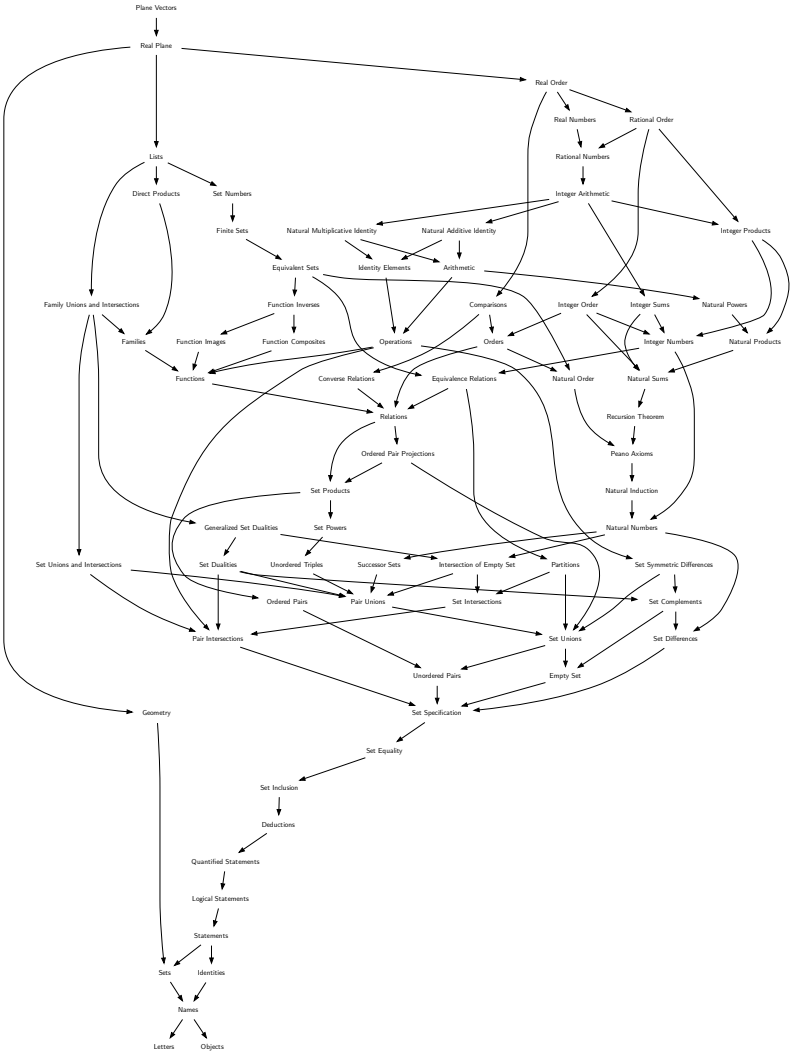
Visualization

As in plane geometry, pictures are indispensable (though they are not proofs). In the figure, indicate the vectors $x, y \in \mathbf{R}^2$ on a plane. We have also indicated the origin, $(0, 0)$, as usual.



Note on terminology

The English word "vector" is from the same Latin word "vector," meaning, literally, carrier. This sense is from the interpretation of a vector as indicating a displacement.


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