Why

[1]

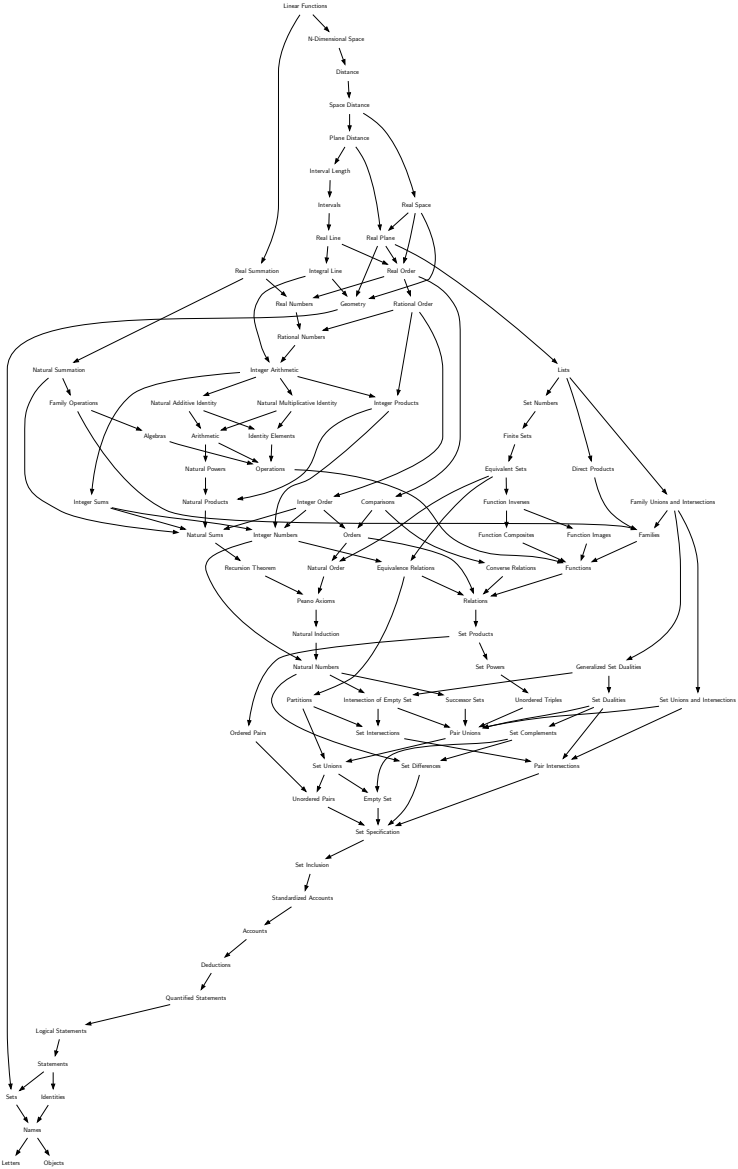
Definition

A function $f : \mathbf{R}^n \to \mathbf{R}^m$ is *linear* if

1. $f(x + y) = f(x) + f(y)$ for all $x, y \in \mathbf{R}^n$ and
2. $f(\alpha x) = \alpha f(x)$ for all $x \in \mathbf{R}^n$ and $\alpha \in \mathbf{R}$.

There are simple consequences to these conditions. For example, $f(0) = 0$. For reasons which may be clarified in future editions, these conditions are sometimes described as *superposition*.

[1] Future editions will include.


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