## Why

## Definition

A *linear functional* on a vector space $V$ with field $k$ is a function $f : V \to k$ which satisfies

$$f(\lambda x + \mu y) = \lambda f(x) + \mu f(y)$$

for all $\lambda, \mu \in k$ and $x, y \in V$.

### Examples

1. Define $F : \mathbf{C}^n \to \mathbf{C}$ by

   $$F(x_1, \ldots, x_n) = c_1 x_1 + c_2 x_2 + \cdots + c_n x_n$$

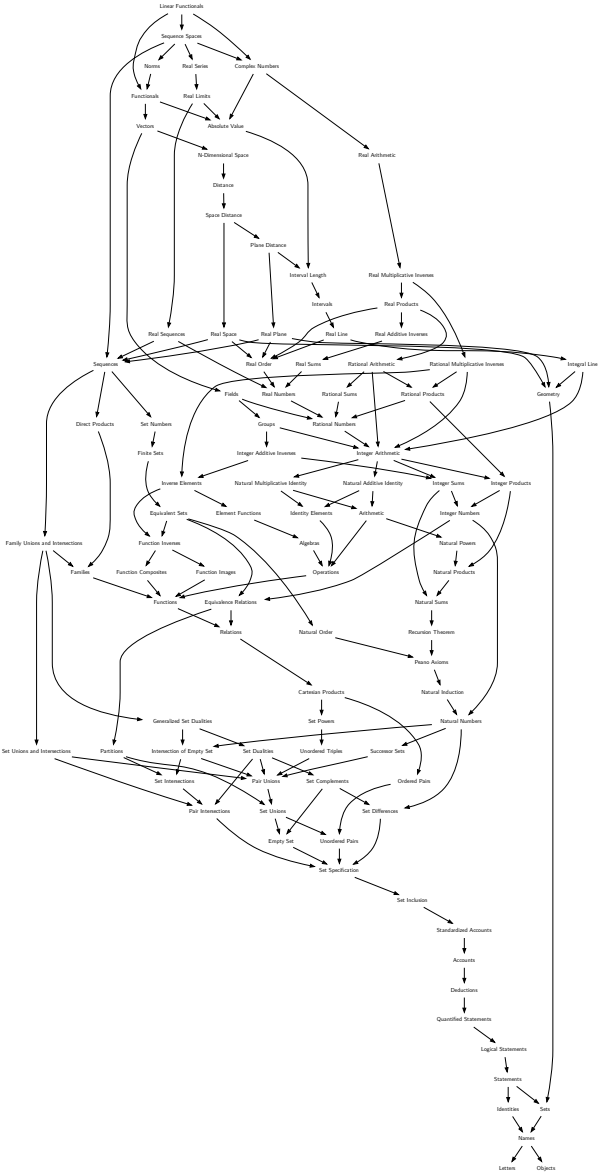
   where $c_1, \ldots, c_n \in \mathbf{C}$.

2. Let $(c_n)_{n \in \mathbf{N}} \in \ell^\infty$. Define $F_c : \ell^1 \to \mathbf{C}$ by

   $$F_c((x_n)_{n \in \mathbf{N}}) = \sum_{n=1}^{\infty} c_n x_n$$

   .

$\wp(A)$.


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