### Definition

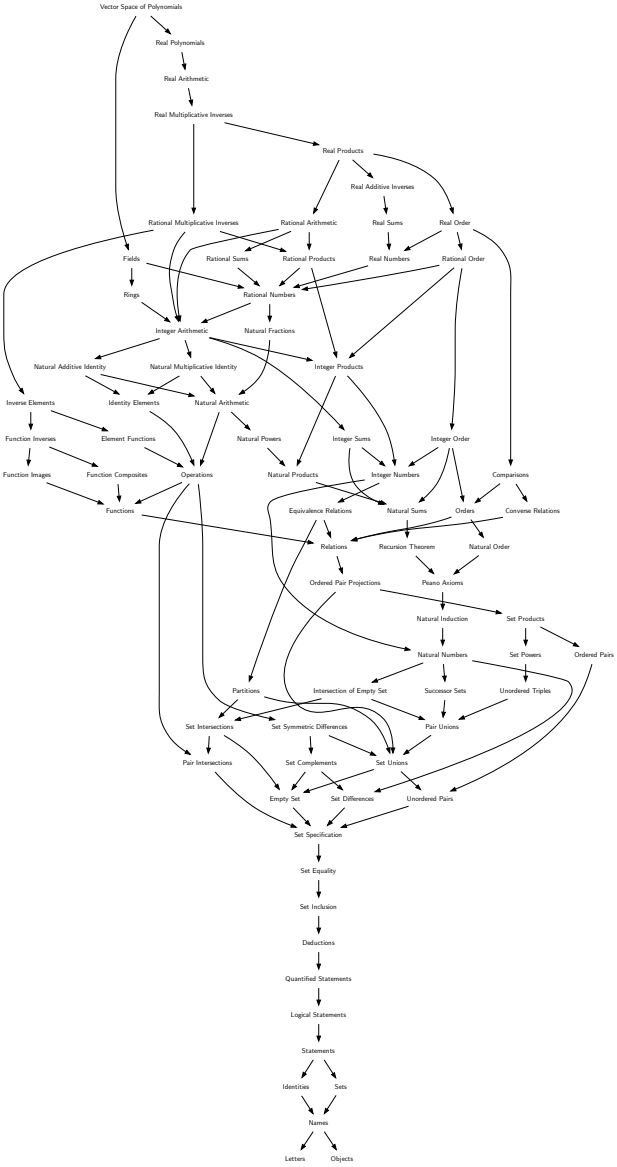
Suppose $\mathbf{F}$ is a field. A function $p : \mathbf{F} \to \mathbf{F}$ is called a *polynomial* with coefficients in $\mathbf{F}$ if there exist $a_0, a_1, \ldots, a_m \in \mathbf{F}$ (for some $m \in \mathbf{N}$) such that

$$p(z) = a_0 + a_1 z + a_2 z^2 + \cdots + a_m z^m \quad \text{for all } z \in \mathbf{F}$$

The set of all polynomials with coefficients in $\mathbf{F}$ is a subspace of the vector space of all function $\mathbf{F}^{\mathbf{F}}$.

#### Notation

The set of all polynomials in $\mathbf{F}$ is sometimes denoted by $\mathbf{P}(\mathbf{F})$ or $\mathcal{P}(\mathbf{F})$.


Vector Space of Polynomials
Real Polynomials
Real Arithmetic
Real Multiplicative Inverses
Real Products
Real Additive Inverses
Rational Multiplicative Inverses
Rational Arithmetic
Real Sums
Real Order
Fields
Rational Sums
Rational Products
Real Numbers
Rational Order
Rings
Rational Numbers
Integer Arithmetic
Natural Fractions
Natural Additive Identity
Natural Multiplicative Identity
Integer Products
Inverse Elements
Identity Elements
Natural Arithmetic
Function Inverses
Element Functions
Natural Powers
Integer Sums
Integer Order
Function Images
Function Composites
Operations
Natural Products
Integer Numbers
Comparisons
Functions
Equivalence Relations
Natural Sums
Orders
Converse Relations
Relations
Recursion Theorem
Natural Order
Ordered Pair Projections
Peano Axioms
Natural Induction
Set Products
Natural Numbers
Set Powers
Ordered Pairs
Partitions
Intersection of Empty Set
Successor Sets
Unordered Triples
Set Intersections
Set Symmetric Differences
Pair Unions
Pair Intersections
Set Complements
Set Unions
Empty Set
Set Differences
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects