Why

Suppose we are going to make a several measurements. We associate to each element of a finite set a number. If the measurements we make are divided into proportions according to a distribution, if we make all the measurements and then average the results what do we expect to get.[1]

Definition

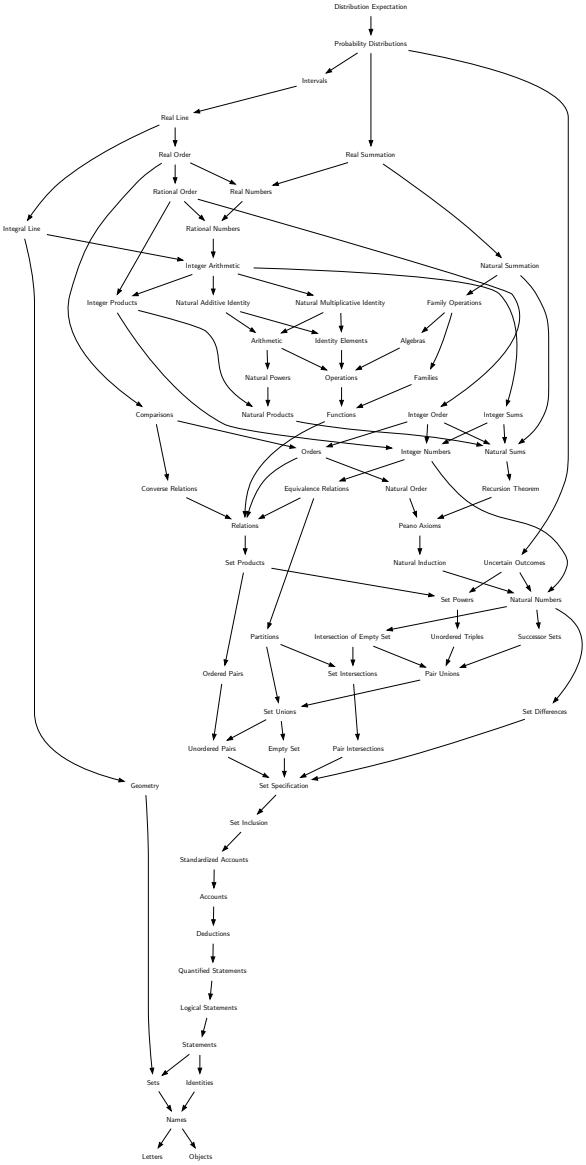
Consider a distribution p and a real-valued function f. The *distribution expectation* of f *under* p is the sum of the product of the results of p and f on the elements of the set.

Notation

Let A a finite set. Let $p : A \to [0, 1]$ a distribution on a finite set A and let $f : A \to \mathbf{R}$ a function on A. The expectation of f under p is

$$\sum_{a \in A} p(a) f(a).$$

[1] Future editions will modify.


Distribution Expectation
Probability Distributions
Intervals
Real Line
Real Order
Real Summation
Rational Order
Real Numbers
Integral Line
Rational Numbers
Integer Arithmetic
Natural Summation
Integer Products
Natural Additive Identity
Natural Multiplicative Identity
Family Operations
Arithmetic
Identity Elements
Algebras
Natural Powers
Operations
Families
Comparisons
Natural Products
Functions
Integer Order
Integer Sums
Orders
Integer Numbers
Natural Sums
Converse Relations
Equivalence Relations
Natural Order
Recursion Theorem
Relations
Peano Axioms
Set Products
Natural Induction
Uncertain Outcomes
Set Powers
Natural Numbers
Partitions
Intersection of Empty Set
Unordered Triples
Successor Sets
Ordered Pairs
Set Intersections
Pair Unions
Set Unions
Set Differences
Unordered Pairs
Empty Set
Pair Intersections
Geometry
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects