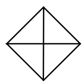


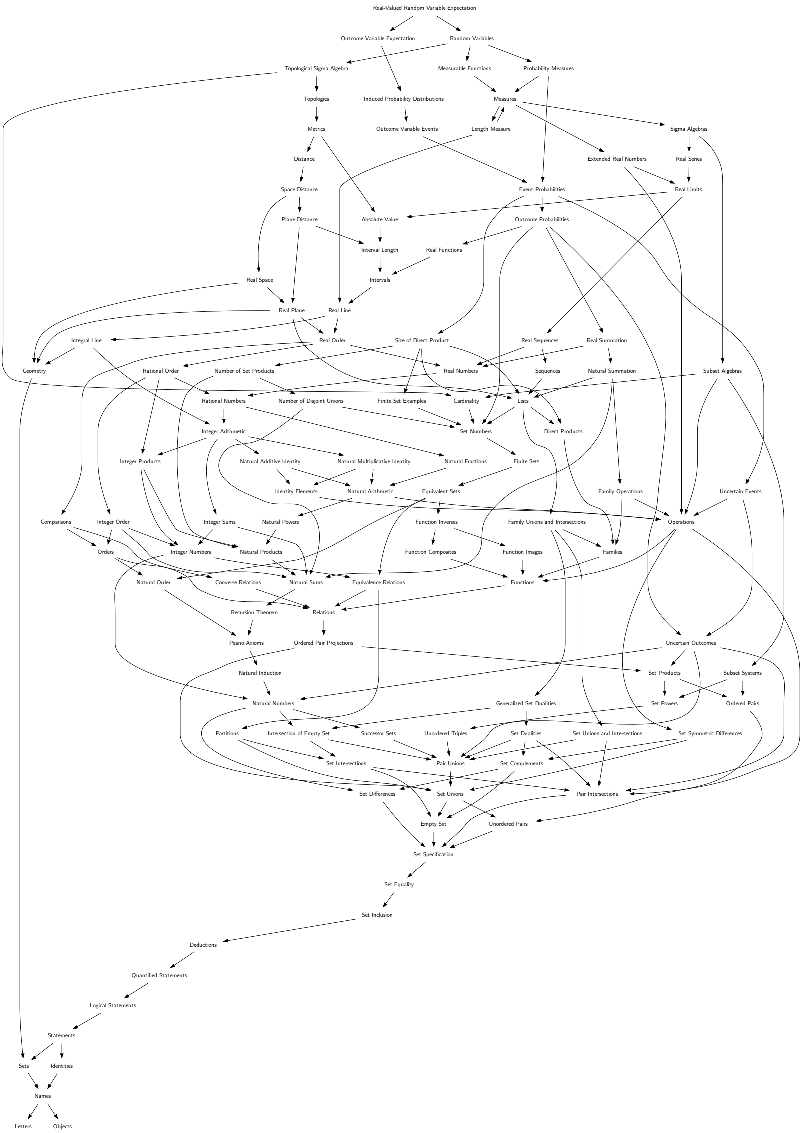
Definition

The *expectation* (or *expected value*) of a real-valued random variable defined on a probability space is its integral with respect to the probability measure. The expectation of a random variable is also called its *mean*.

Notation

Suppose $f : X \to \mathbf{R}$ is a random variable on a probability space $(X, \mathcal{A}, P)$. We denote the expectation of f by $\mathbf{E}f$, so that

$$\mathbf{E}f := \int f dP.$$


Real-Valued Random Variable Expectation
Outcome Variable Expectation
Random Variables
Topological Sigma Algebra
Measurable Functions
Probability Measures
Topologies
Induced Probability Distributions
Measures
Metrics
Outcome Variable Events
Length Measure
Sigma Algebras
Distance
Extended Real Numbers
Real Series
Space Distance
Event Probabilities
Real Limits
Plane Distance
Absolute Value
Outcome Probabilities
Interval Length
Real Functions
Real Space
Intervals
Real Plane
Real Line
Integral Line
Real Order
Size of Direct Product
Real Sequences
Real Summation
Geometry
Rational Order
Number of Set Products
Real Numbers
Sequences
Natural Summation
Subset Algebras
Rational Numbers
Number of Disjoint Unions
Finite Set Examples
Cardinality
Lists
Integer Arithmetic
Set Numbers
Direct Products
Integer Products
Natural Additive Identity
Natural Multiplicative Identity
Natural Fractions
Finite Sets
Identity Elements
Natural Arithmetic
Equivalent Sets
Family Operations
Uncertain Events
Comparisons
Integer Order
Integer Sums
Natural Powers
Function Inverses
Family Unions and Intersections
Operations
Orders
Integer Numbers
Natural Products
Function Composites
Function Images
Families
Natural Order
Converse Relations
Natural Sums
Equivalence Relations
Functions
Recursion Theorem
Relations
Peano Axioms
Ordered Pair Projections
Uncertain Outcomes
Natural Induction
Set Products
Subset Systems
Natural Numbers
Generalized Set Dualities
Set Powers
Ordered Pairs
Partitions
Intersection of Empty Set
Successor Sets
Unordered Triples
Set Dualities
Set Unions and Intersections
Set Symmetric Differences
Set Intersections
Pair Unions
Set Complements
Set Differences
Set Unions
Pair Intersections
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects