Why

[1]

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

Let $(X, \mathcal{A}, \mu)$ be a probability space and $f : X \to \mathbf{R}$ be a random variable. We denote the expectation of f by $\mathbf{E}\, f$. We defined it by

$$\mathbf{E}\, f = \int f d\mu.$$

[1] Future editions will include this.


Expectation
Random Variables
Topological Sigma Algebra
Measurable Functions
Outcome Variables
Topological Spaces
Metrics
Distance
Absolute Value
Space Distance
Probability Measures
Plane Distance
Event Probabilities
Measures
Interval Length
Probability Distributions
Extended Real Numbers
Uncertain Outcomes
Intervals
Real Limits
Real Space
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Real Line
Real Order
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Real Sequences
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Sequences
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Direct Products
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Sigma Algebras
Finite Sets
Integer Arithmetic
Natural Summation
Natural Multiplicative Identity
Natural Additive Identity
Family Operations
Subset Algebras
Arithmetic
Identity Elements
Algebras
Set Operations
Cardinality
Equivalent Sets
Function Inverses
Family Unions and Intersections
Natural Exponents
Operations
Integer Products
Integer Sums
Function Composites
Function Images
Families
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Functions
Equivalence Relations
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Recursion Theorem
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Subset Systems
Natural Induction
Set Powers
Ordered Pairs
Generalized Set Dualities
Unordered Triples
Natural Numbers
Partitions
Set Unions and Intersections
Intersection of Empty Set
Set Dualities
Successor Sets
Set Symmetric Differences
Set Intersections
Pair Unions
Set Complements
Pair Intersections
Set Unions
Set Differences
Empty Set
Unordered Pairs
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects