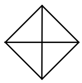


Definition

The *variance* of a square-integrable real-valued random variable is the expectation of its square less its expectation squared.

Notation

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

$$\mathbf{var}\, f = \mathbf{E}(f^2) - (\mathbf{E}(f))^2.$$

Results

PROPOSITION **1.** *If a random variable on a probability space is square integrable then it is integrable.*

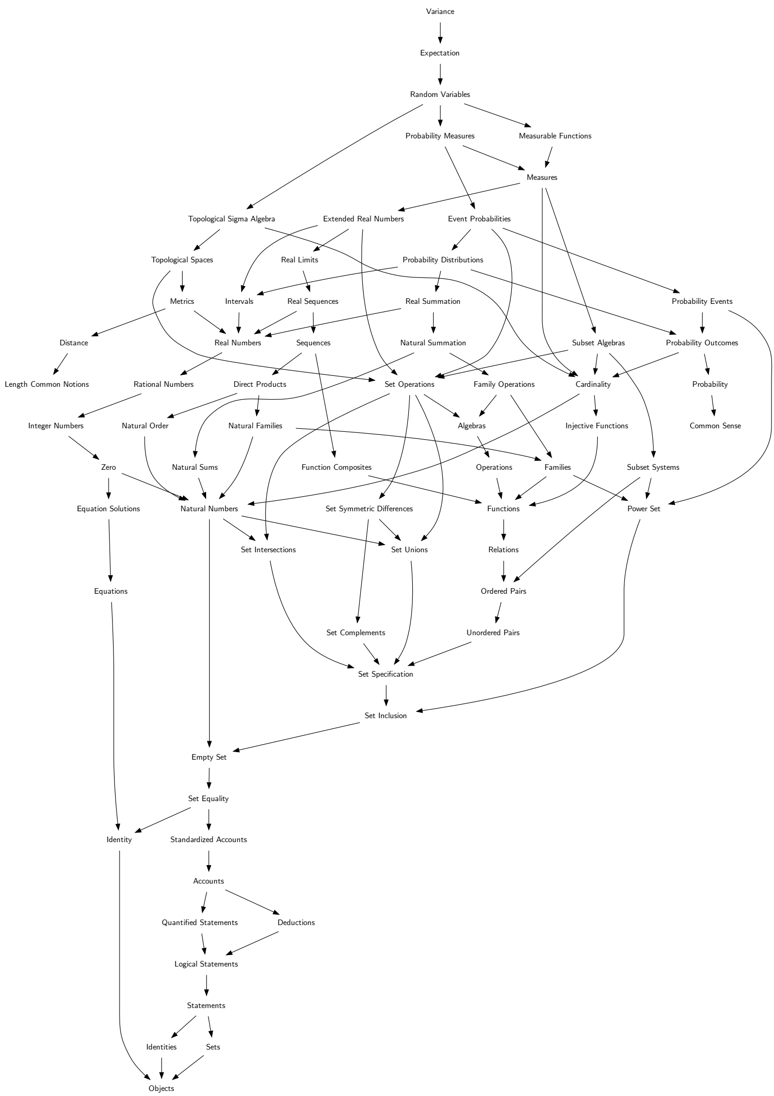
Proof. The L^p spaces are nested for finite measures. □

PROPOSITION **2.** *The variance of a square-integrable real-valued random variable is the expectation of the square of the difference between the random variable and its expectation.*

Proof.

$$\mathbf{var}\, f = \mathbf{E}((f - \mathbf{E}(f))^2)$$

□


Variance
Expectation
Random Variables
Probability Measures
Measurable Functions
Measures
Topological Sigma Algebra
Extended Real Numbers
Event Probabilities
Topological Spaces
Real Limits
Probability Distributions
Metrics
Intervals
Real Sequences
Real Summation
Probability Events
Distance
Real Numbers
Sequences
Natural Summation
Subset Algebras
Probability Outcomes
Length Common Notions
Rational Numbers
Direct Products
Set Operations
Family Operations
Cardinality
Probability
Integer Numbers
Natural Order
Natural Families
Algebras
Injective Functions
Common Sense
Zero
Natural Sums
Function Composites
Operations
Families
Subset Systems
Equation Solutions
Natural Numbers
Set Symmetric Differences
Functions
Power Set
Set Intersections
Set Unions
Relations
Equations
Ordered Pairs
Set Complements
Unordered Pairs
Set Specification
Set Inclusion
Empty Set
Set Equality
Identity
Standardized Accounts
Accounts
Quantified Statements
Deductions
Logical Statements
Statements
Identities
Sets
Objects