Why

We name the image measure of a collection of real-valued random variables.

Definition

The *joint law* of an ordered finite family of n real-valued random variables is the image measure of the tuple-valued function whose components are the individual random variables.

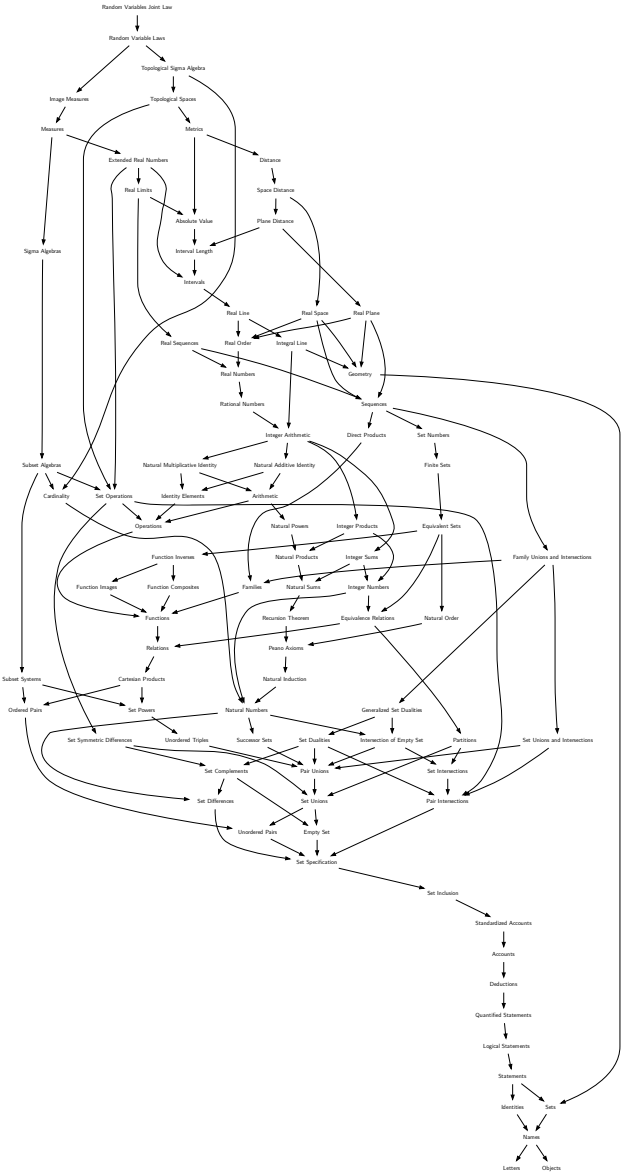
Notation

Let $(X, \mathcal{A}, \mu)$ be a probability space and $(Y, \mathcal{B})$ be a measurable space. Let $f_1, \ldots, f_n : X \to Y$ be random variables. Define $f : X \to Y^n$ by $(f(x))_i = f_i(x)$. The joint law is the image measure of f.

We denote the joint law of $\{f_i\}$ by $\mu_{f_1,\ldots,f_n} : \mathcal{A} \to [0, \infty]$. We defined it by

$$\mu_{f_1,\ldots,f_n}(A) = \mu(\{x \in X \mid f(x) \in A\}).$$

for all A in the product sigma algebra on Y^n.


Random Variables Joint Law
Random Variable Laws
Topological Sigma Algebra
Image Measures
Topological Spaces
Measures
Metrics
Extended Real Numbers
Distance
Real Limits
Space Distance
Absolute Value
Plane Distance
Sigma Algebras
Interval Length
Intervals
Real Line
Real Space
Real Plane
Real Sequences
Real Order
Integral Line
Geometry
Real Numbers
Rational Numbers
Sequences
Integer Arithmetic
Direct Products
Set Numbers
Subset Algebras
Natural Multiplicative Identity
Natural Additive Identity
Finite Sets
Cardinality
Set Operations
Identity Elements
Arithmetic
Operations
Natural Powers
Integer Products
Equivalent Sets
Function Inverses
Natural Products
Integer Sums
Family Unions and Intersections
Function Images
Function Composites
Families
Natural Sums
Integer Numbers
Functions
Recursion Theorem
Equivalence Relations
Natural Order
Relations
Peano Axioms
Subset Systems
Cartesian Products
Natural Induction
Ordered Pairs
Set Powers
Natural Numbers
Generalized Set Dualities
Set Symmetric Differences
Unordered Triples
Successor Sets
Set Dualities
Intersection of Empty Set
Partitions
Set Unions and Intersections
Set Complements
Pair Unions
Set Intersections
Set Differences
Set Unions
Pair Intersections
Unordered Pairs
Empty Set
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects