Why

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

Definition

The *joint law* of a sequence of n real-valued random variables is the image measure of the tuple-valued function whose components are the individual random variables.

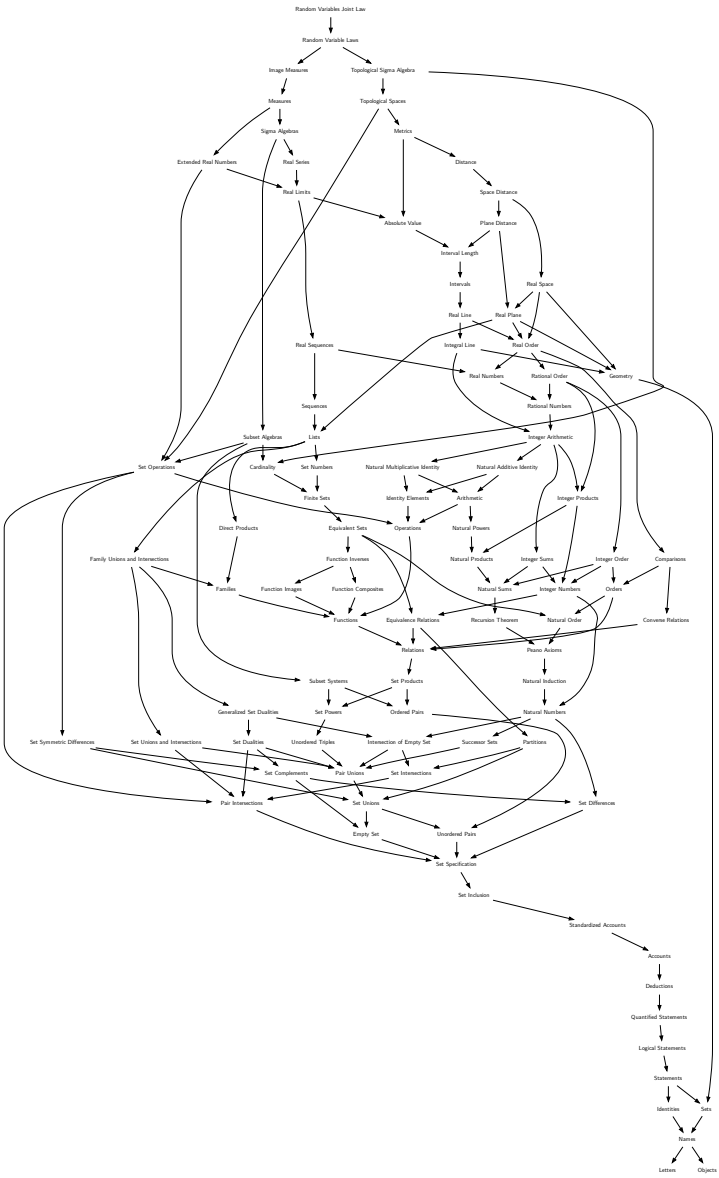
Notation

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