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.

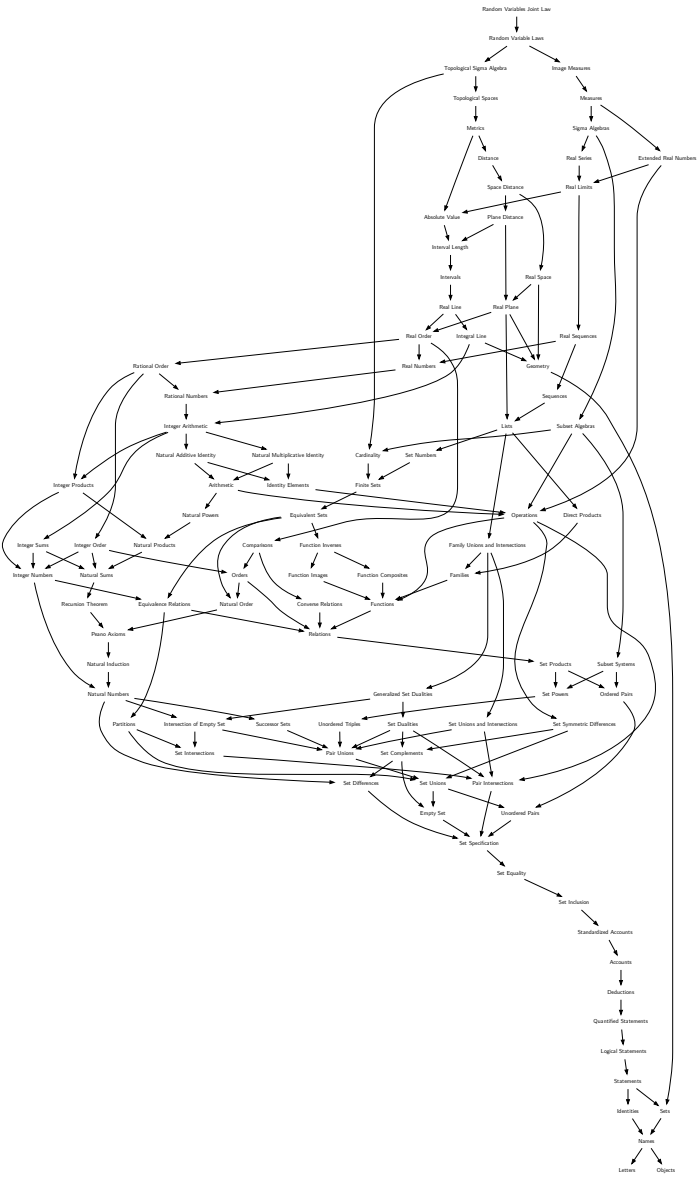
Notation

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