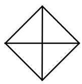


Why

A probability event function is a measure on the set of outcomes.

Definition

A *probability measure* is a finite measure on a measurable space which assigns the value one to the base set. A finite measure can always be scaled to a probability measure, so these measures are standard examples of finite measures.

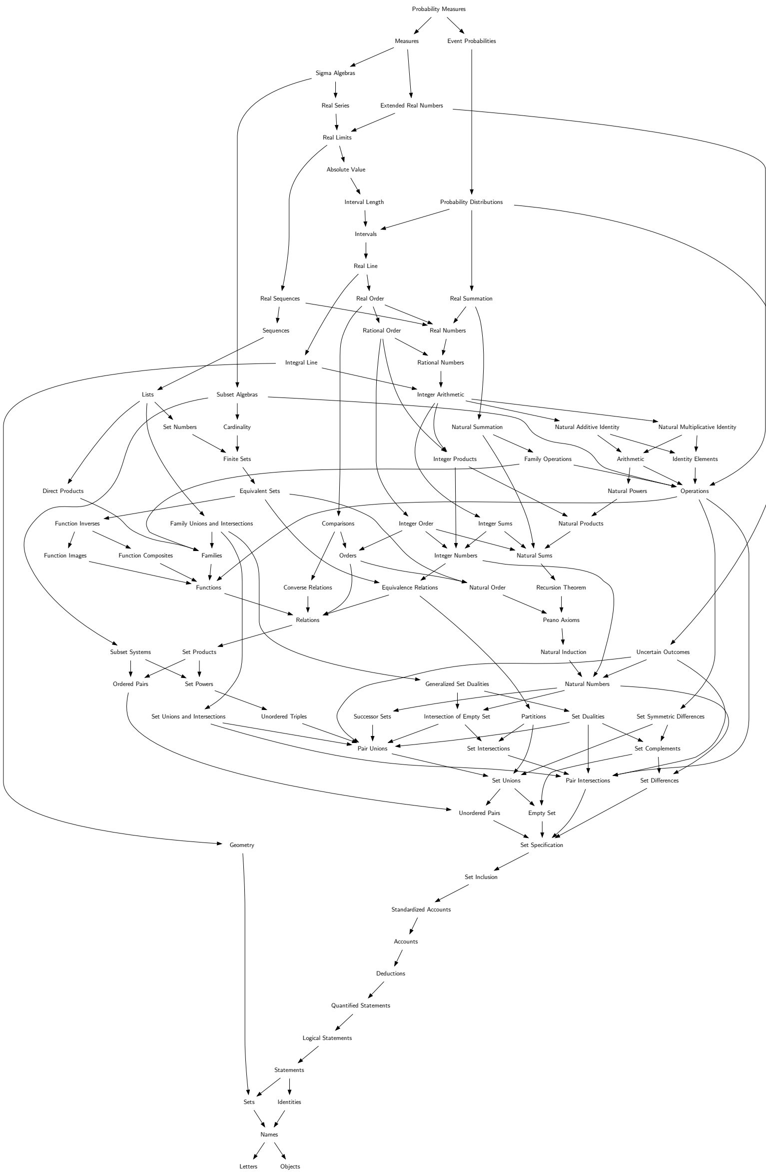
A *probability space* is a measure space whose measure is a probability measure. The word "space" is natural, since the notion of a measure generalized the notion of volume in real space (see Real Space and N-Dimensional Space). The *outcomes* of a probability space are the elements of the base set. The *set of outcomes* is the base set. The *events* are the elements of the sigma algebra. The measure in a probability space corresponds to the event probability function.

Notation

Let $(A, \mathcal{A})$ be a measurable space.[1] We denote the sigma-algebra by $\mathcal{A}$, as usual. We denote a probability measure by P, a mnemonic for "probability," and intended to remind of the event probabilty function. Thus, we often say "Let $(A, \mathcal{A}, \mathsf{P})$ be a probability space."

Many authors associate an event $A \in \mathcal{A}$ with a function $\pi : \mathcal{X} \to \{0, 1\}$ so that $A = \{x \in \mathcal{X} \mid \pi(x) = 1\}$. In this context, it is common to write $\mu[\pi(x)]$ for $\mu(A)$.

[1] Often, other authors will denote the set of outcomes (here denoted by A) by Ω, an apparent mnemonic for "outcomes".


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