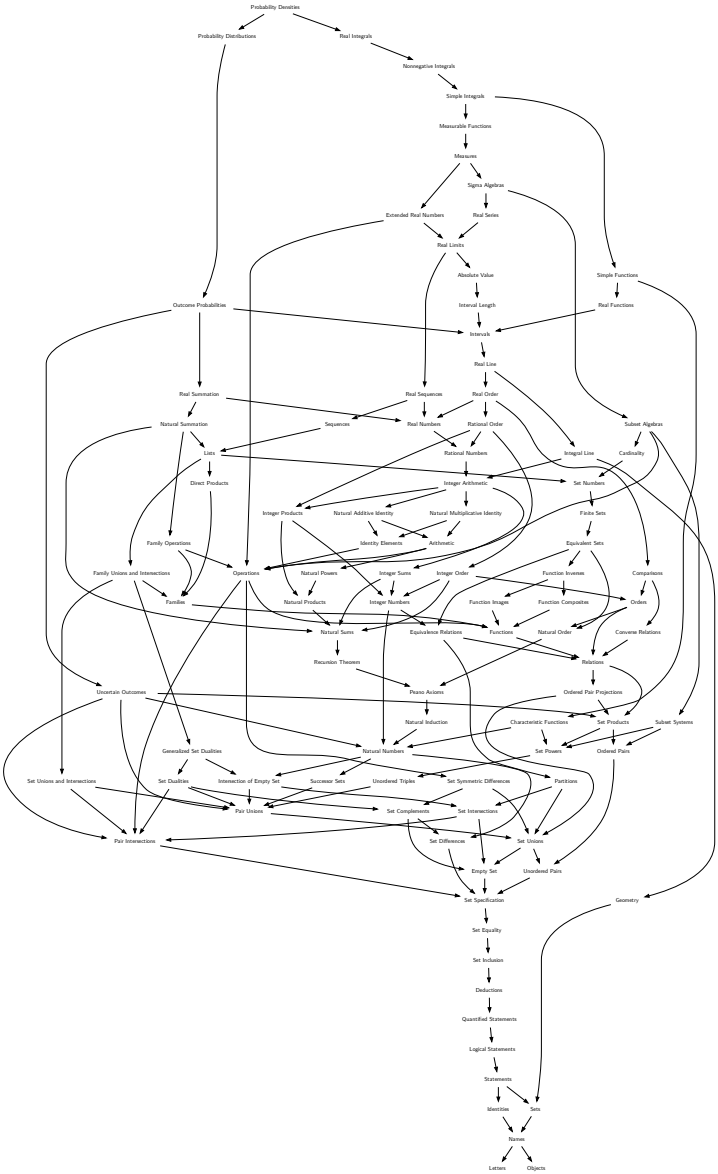
Why

What if the set of outcomes is the real line, $\mathbf{R}$?

Definition

The principal difficulty is assigning nonzero numbers to infinitely many elements of a set. The solution is instead to assign probabilities to the *events* of outcomes, not to the individual outcomes (elementary events, real numbers), themselves.

A *probability density* (or *probability density function* (*pdf*)) is a function $f : \mathbf{R} \to \mathbf{R}$ satisfying $f \geq 0$ and $\int f = 1$.


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