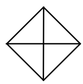


Why

We define integrals using an infinite process; in order for each step of the process to make sense, we need functions to be measurable.[1]

Definition

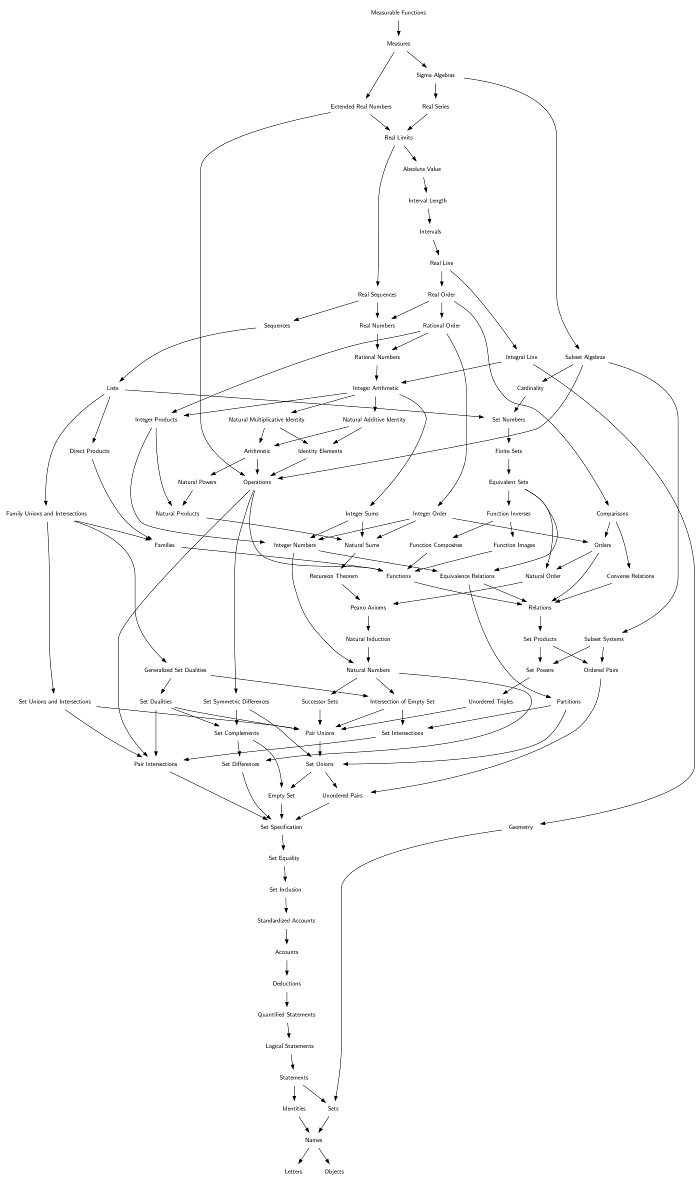
A function between the base sets of two measurable spaces is *measurable* with respect to the distinguished sets of the two spaces if the inverse image of every distinguished subset of the codomain is a distinguished subset of the domain.

Notation

Let $(X, \mathcal{A})$ and $(Y, \mathcal{B})$ be measurable spaces. Then a function $f : X \to Y$ is measurable if $B \in \mathcal{B}$ implies $f^{-1}(B) \in \mathcal{A}$. We say that f is measurable with respect to $\mathcal{A}$ and $\mathcal{B}$.

In this case, we sometimes say f is a measurable function from $(X, \mathcal{A})$ to $(Y, \mathcal{B})$. We say, $f : (X, \mathcal{A}) \to (Y, \mathcal{B})$ is measurable, read aloud as "f from X, A to Y, B is measurable."

[1] This statement contains a forward reference to Real Integrals, and so may be modified in future editions.


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