## Why

We want a form of the dominated convergence theorem in terms of convergence in measure.[1]

## Definition

A sequence of real-valued measurable functions *converges in measure* to a real-valued measurable limit function if for every positive number the measures of the set where the function deviates from the limit function by more than the positive number converges to zero.

### Notation

Let $(X, \mathcal{A}, \mu)$ be a measure space. Let $(f_n)_n$ a sequence of real-valued measurable functions on $X$. Let $f$ be a measurable real-valued function on $X$. If $f_n$ converges in measure to $f$ we write: $f_n \longrightarrow f$ in measure, read aloud as "f n goes to f in measure."

Suppose $f_n \longrightarrow f$ in measure. Then for every $\varepsilon > 0$,

$$\lim_{n\to\infty} \mu(\{x \in X \mid |f_n(x) - f(x)| > \varepsilon\}) = 0.$$

[1] Future editions will expand.

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