Why

We want to talk about how a function of multiple real-valued arguments changes with respect to changes in its arguments.

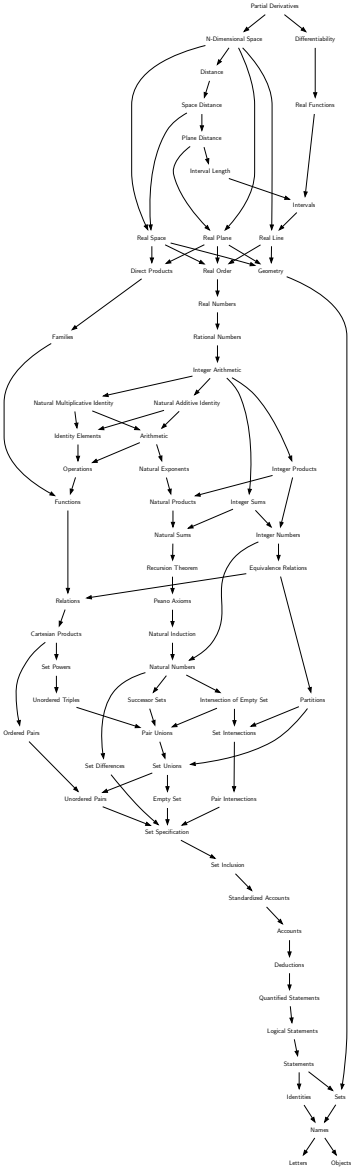
Definition

Consider a real-valued function on d-dimensional space. For $i = 1, \ldots, d$, Fix a point x. consider the limit of a sequence of quotients of the difference of the result of that function at a point the consider the limit of a sequence of quotients of the value changed at component The *partial derivative* of the function with respect to the ith the function which maps d-dimensional vectors of real numbers to the limit of a seq of all of the quotient between the point to argument is the limit of the rate with a The partial derivative of a

Let $f : \mathbf{R}^d \to \mathbf{R}$ For $i = 1, \ldots, d$, define Let $g_i : \mathbf{R}^d \to \mathbf{R}$ by

$$g_i(x) = \lim_{h \to 0} \frac{f(x + he_i) - f(x)}{h}$$

for each x


Partial Derivatives
N-Dimensional Space
Differentiability
Distance
Space Distance
Real Functions
Plane Distance
Interval Length
Intervals
Real Space
Real Plane
Real Line
Direct Products
Real Order
Geometry
Real Numbers
Families
Rational Numbers
Integer Arithmetic
Natural Multiplicative Identity
Natural Additive Identity
Identity Elements
Arithmetic
Operations
Natural Exponents
Integer Products
Functions
Natural Products
Integer Sums
Natural Sums
Integer Numbers
Recursion Theorem
Equivalence Relations
Relations
Peano Axioms
Cartesian Products
Natural Induction
Set Powers
Natural Numbers
Unordered Triples
Successor Sets
Intersection of Empty Set
Partitions
Ordered Pairs
Pair Unions
Set Intersections
Set Differences
Set Unions
Unordered Pairs
Empty Set
Pair Intersections
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects