Why

The second derivative (if it exists) is the derivative of the derivative of a function. Can we continue in this way?

Definition

Let $A \subset \mathbf{R}$. Let $f : A \to \mathbf{R}$ be twice differentiable. We call f *three times differentiable* (or *thrice differentiable*) if its second derivative is differentiable. We call the derivative of the second derivative of f the *third derivative* of f.

Generally, for $n \geq 3$, we call f $n + 1$-*times differentiable* if f is n-times differentiable. The $n + 1th$ *derivative* of a $n + 1$-times differenetiable function is the derivative the nth derivative of the function.

Notation

The nth derivative of a function $f : A \to \mathbf{R}$ is sometimes denoted $f^{(n)} : A \to \mathbf{R}$.

Higher Order Derivatives

Second Derivatives

Real Open Sets

Differentiable Functions

N-Dimensional Space

Distance

Real Functions

Space Distance

Plane Distance

Interval Length

Real Space

Intervals

Real Plane

Real Line

Real Order

Integral Line

Geometry

Rational Order

Real Numbers

Rational Numbers

Lists

Integer Arithmetic

Set Numbers

Natural Multiplicative Identity

Natural Additive Identity

Integer Products

Finite Sets

Identity Elements

Arithmetic

Direct Products

Equivalent Sets

Natural Powers

Family Unions and Intersections

Function Inverse

Comparisons

Integer Order

Integer Sums

Natural Products

Families

Function Composites

Function Images

Operations

Orders

Integer Numbers

Natural Sums

Functions

Converse Relations

Equivalence Relations

Natural Order

Recursion Theorem

Relations

Peano Axioms

Set Products

Natural Induction

Generalized Set Dualities

Set Powers

Natural Numbers

Set Unions and Intersections

Set Dualities

Unordered Triples

Successor Sets

Intersection of Empty Set

Partitions

Set Symmetric Differences

Ordered Pairs

Pair Unions

Set Intersections

Set Complements

Pair Intersections

Set Unions

Set Differences

Unordered Pairs

Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets

Identities

Names

Letters

Objects