

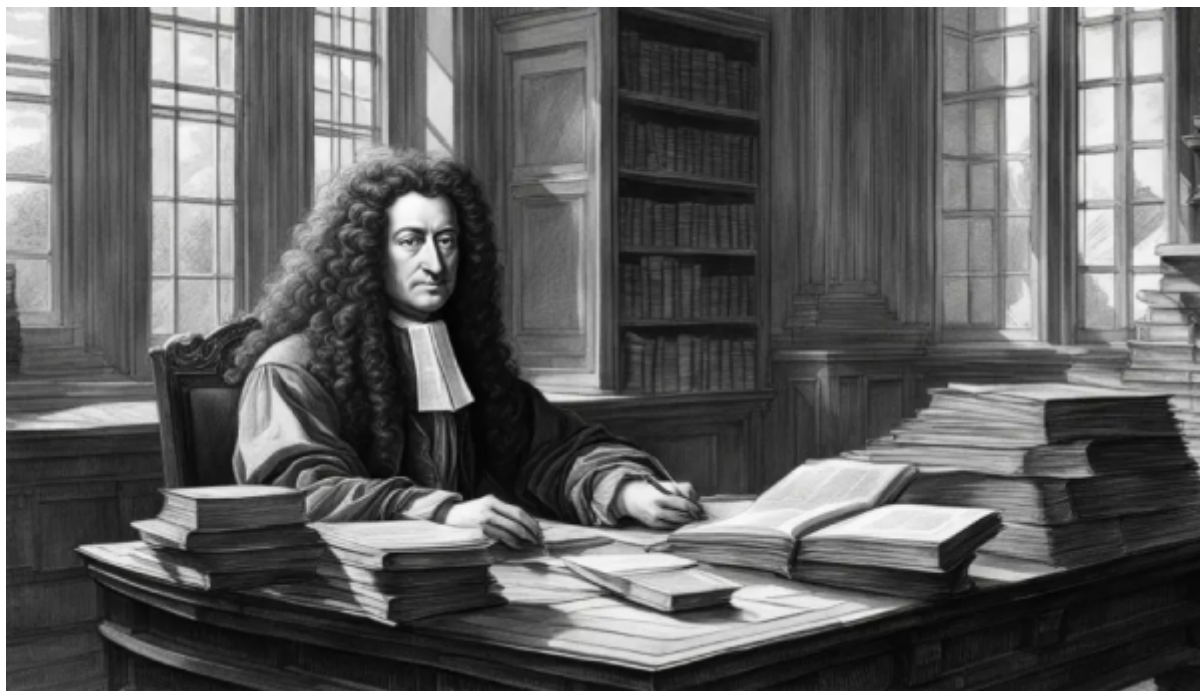
# Mathematical Analysis

- [Leibniz's Notation](#)

# Leibniz's Notation

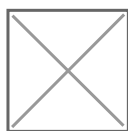
## Who is Leibniz

Gottfried Wilhelm Leibniz (1646 - 1716) was a 17th century German mathematician. He's often credited with developing many of the main principles of differential and integral calculus, and is primarily recognized for what we now call Leibniz's notation.

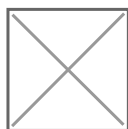


## Leibniz's Notation System

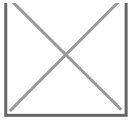
The derivative of a function based on today's standard is given by:



Leibniz's notation expresses the derivative as:



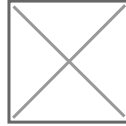
where goes



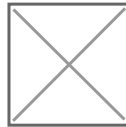
toward 0.

## Fractional Behavior

Let's review some examples where Leibniz's notation is often utilized. The Chain Rule using Lagrange Notation states:



We can translate the above Chain Rule into Leibniz's Notation as:



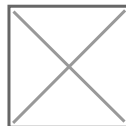
In the above equations, we can see how Leibniz's Notation behaves similarly to a fraction, although it must be emphasized that the derivative is not a fraction.

## Try It on a Function

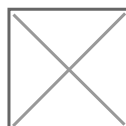
Let us try .

**Click to Expand/Collapse**

Expand the function:



Simplify fraction:



So the derivative of  is .