Math in Biometrics

- Mathematical Analysis
  - Leibniz's Notation

Mathematical Analysis

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Leibniz's Notation

Who is Leibniz

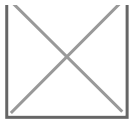
Gottfried Wilhelm Leibniz (1646 - 1716) was a 17th century German mathematician. He’s often credited with developing many of the main principles of differential and integral calculus, and is primarily recognized for what we now call Leibniz’s notation.

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  .