Expression exploration

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1 Introduction

Worryingly, the importance of the derriviation is underestimated nowadays. In this extraordinary article I will show that the calculation and use of the derivative can be very interesting Our British scientists with Italian names living in America have spent about **17 YEARS, 14 MONTHS, and 47 DAYS** studying the derivative problem and writing universal and unique differentiator. This article fully presents the results of their work!

With this article, I want to restore the former greatness of mathematics and help the humanity, and what's more, most importantly, first-year students of the Moscow Institute of Physics and Technology!!!

2 Some basic knowledge about researching problem...

Parameters and constants we use in this work (all data is qualified):

Constants (3):
e = 2.718282
pi = 3.141593
AbObA = 1337.228690

Variables (1):
x = 0.000000

Parameters of exploration :
Number of differentiates = 2
Macloren's accuracy = 5
Tanget point = 0.000000
Delta coverage of tangent point = 0.500000
Graph diapasone = $[-2 : 2]$

So let's calculate smth with a given function:

$f(x) = \ln(1 + x)$

3 Exploration of the expression

- Calculation a value of function in the point

BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!
In the point $M_0(x_0) = (0.000)$ expression's value = 0.00000

- Finding the first derivation of function

Personally, I've always thought about first derivation of something like that function... Haven't you? But now, by using informatics and math skills I feel that I'm prepared enough to calculate it!

`1 step:` Finding a derivation of x

While preparing for exams, I learned a lot of new things, for example:

$(x)' =$

$= 1$

`2 step:` Finding a derivation of 1

Only after two cups of beer you might understand it:

$(1)' =$

$= 0$

`3 step:` Finding a derivation of $1 + x$

Never say it to girls:

$(1 + x)' =$

$= 1$

`4 step:` Finding a derivation of $\ln(1+x)$

Only by using special skills we might know::

$(\ln(1+x))' =$ **... = [top secret] = ...** $=$

$= \frac{1}{1+x}$

Congratulations! **The first derivation of the expression** is:

$f'(x) = \frac{1}{1+x}$

In the point $M_0(x_0) = (0.000)$ **it's value = 1.00000**

- Finding the 2 derivation

1) Let's find **the 1 derivation** of the given function:

`1 step:` Finding a derivation of x

What if:

$(x)' =$

$= 1$

`2 step:` Finding a derivation of 1

Even my two-aged sister knows that:

$(1)' =$

$= 0$

`3 step:` Finding a derivation of $1+x$

The first task in MIPT was to calculate:

$(1+x)' =$

$= 1$

`4 step:` Finding a derivation of $\ln(1+x)$

Never say it to girls:

$(\ln(1+x))' =$

$= \frac{1}{1+x}$

So **the 1 derivation** of the function is:

$\frac{1}{1+x}$

2) Let's find **the 2 derivation** of the given function:

`1 step:` Finding a derivation of x

It's simple as fuck:

$(x)' =$ **... = [top secret] = ...** $=$

$= 1$

`2 step:` Finding a derivation of 1

As we know:

$(1)' =$

$= 0$

`3 step:` Finding a derivation of $1+x$

I was asked not to tell anyone that:

$(1+x)' =$

$= 1$

`4 step:` Finding a derivation of 1

Only after two cups of beer you might understand it:

$(1)' =$ **... = [top secret] = ...** $=$

$= 0$

`5 step:` Finding a derivation of $\frac{1}{1+x}$

Even my two-aged sister knows that:

$(\frac{1}{1+x})' =$

$= \frac{(-1)\cdot 1}{(1+x)^2}$

So **the 2 derivation** of the function is:

$\frac{(-1)}{(1+x)^2}$

Finally... The 2 derivation of the expression:

$f^{(2)}(\mathrm{x}) = \frac{(-1)}{(1+x)^2}$

BRITISH SCIENTISTS WERE SHOCKED AGAIN, BECAUSE THEY COUNT THE 2 DERIVATION OF THIS FUNCTION!!!

In the point $M_0(x_0) = (0.000)$ **it's value = -1.00000**

- Finding partical derivations

Partical derivation of the expression on the variable **x**:

$\frac{\partial f}{\partial x} = \frac{1}{1+x}$

In the point $M_0(x_0) = (0.000)$ **it's value = 1.00000** !!!

- Finding full derivation

Full derivation:

$\sqrt{(\frac{1}{1+x})^2}$

In the point $M_0(x_0) = (0.000)$ **it's value = 1.00000** !!!

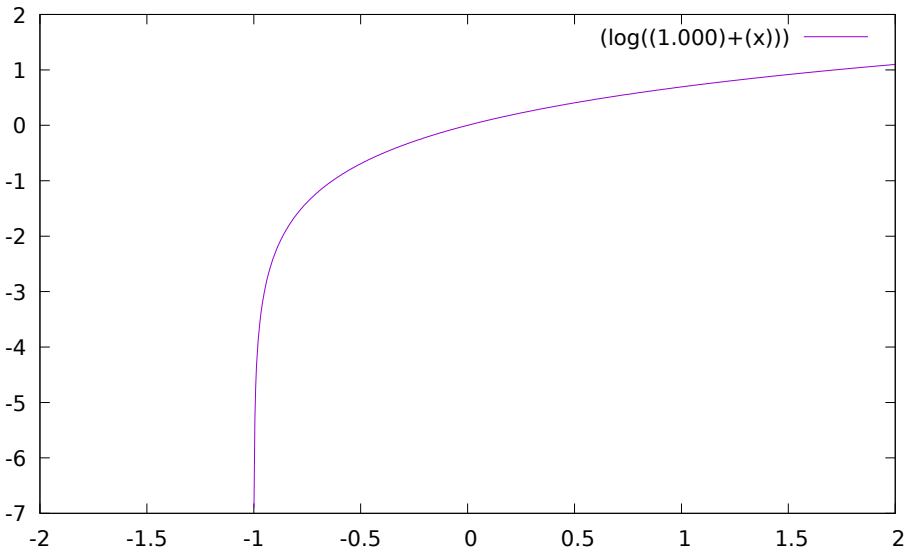
- Decomposing on Macloren's formula

First 5 members of Maklorens decomposition for $x \to x_0 = 0.000$**:**

$\mathrm{f(x)} = x + (-0.5)\cdot x^2 + 0.333333\cdot x^3 + (-0.25)\cdot x^4 + 0.2\cdot x^5 + \mathrm{o}(x^5)$

- Graphics

Graph of $\mathrm{f(x)} = \ln(1+x)$ on the diapasone $x \in [-2:2]$:

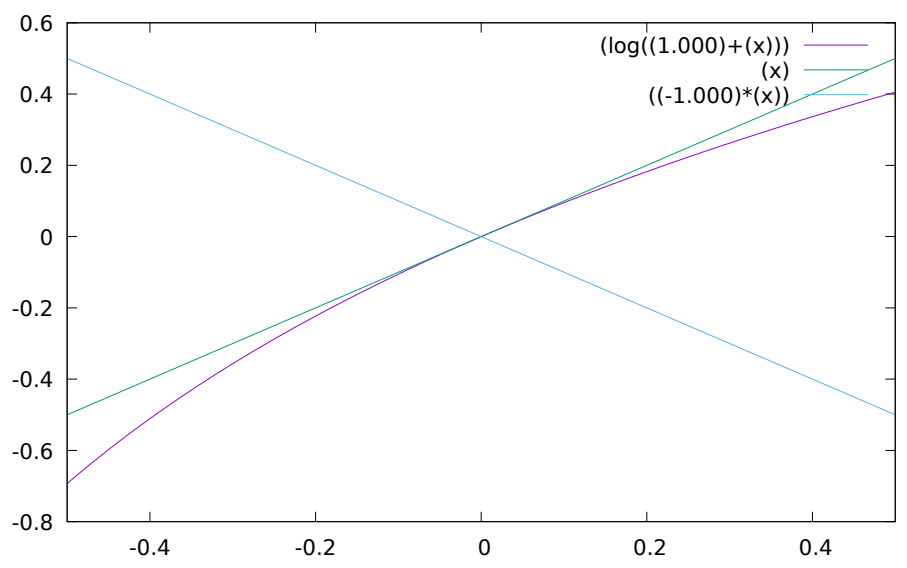


- Equations in the point

Tangent equation in $x_0 = 0.000$:
$\mathrm{f(x)} = x$

Normal equation in $x_0 = 0.00000$:
$\mathrm{f(x)} = (-1) \cdot x$

Their graphs in $\delta = 0.500$ coverage of the point $x_0 = 0.000$:



4 Conclusion

Thanks Ded for this amazing code experience and a lot of useful advice and care! Happy New Year!!! (Programming language is coming soon...)

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