1 Introduction

$CrInGeCrInGeProduction.Supercringeintroductionhere$:

2 Some basic knowledge about researching problem...

Let's calculate smth with a given function: f(x) = $\ln x$
Firstly, let's simplify this expression (if possible): f(x) = $\ln x$

3 Exploration of the expression

Calculation value of function in the point BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!
In the point $M_0(x_0) = (0.000)$ **it's value** = -inf
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:
$(x)' = ... =$ [top secret] $= ... =$
$= 1.000$
`2 step:` Finding a derivation of $\ln x$
It's really easy to find:
$(\ln x)' = ... =$ [top secret] $= ... =$
$= \frac{1.000}{x}$
Congratulations! **The first derivation of the expression** is:
f'(x) = $\frac{1.000}{x}$
In the point $M_0(x_0) = (0.000)$ it's value = inf

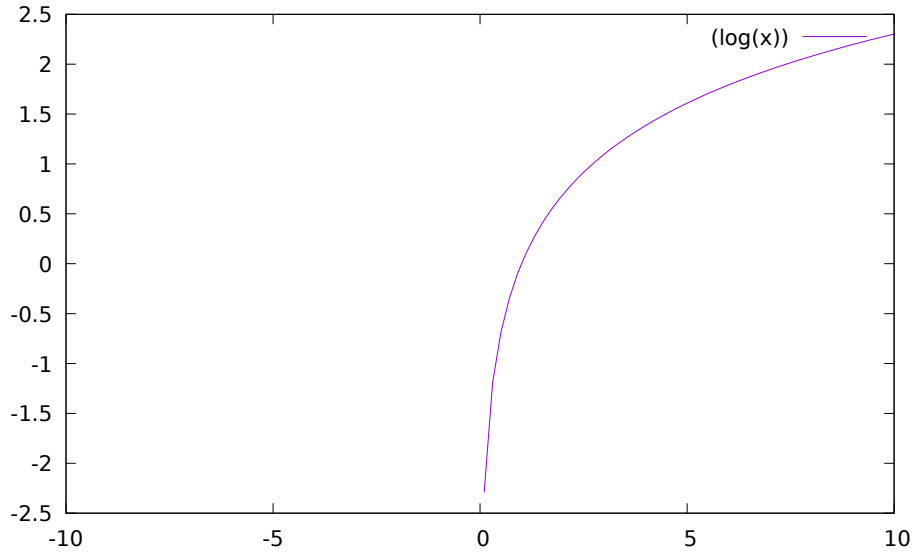
Finding the 3 derivation Let's find **the 1 derivation** of the expression:
`1 step:` Finding a derivation of x
My roommate mumbled it in his sleep all night:
$(x)' = ... =$ [top secret] $= ... =$
$= 1.000$
`2 step:` Finding a derivation of $\ln x$
Sounds logical that it is the same as:
$(\ln x)' = ... =$ [top secret] $= ... =$
$= \frac{1.000}{x}$
Let's find **the 2 derivation** of the expression:
`1 step:` Finding a derivation of x
For centuries, people have hunted for the secret knowledge that:
$(x)' = ... =$ [top secret] $= ... =$
$= 1.000$
`2 step:` Finding a derivation of 1.000
Sounds logical that it is the same as:
$(1.000)' = ... =$ [top secret] $= ... =$
$= 0.000$
`3 step:` Finding a derivation of $\frac{1.000}{x}$
It's really easy to find:
$(\frac{1.000}{x})' = ... =$ [top secret] $= ... =$
$= \frac{(-1.000)\cdot 1.000}{x^{2.000}}$
Let's find **the 3 derivation** of the expression:
`1 step:` Finding a derivation of x
My roommate mumbled it in his sleep all night:
$(x)' = ... =$ [top secret] $= ... =$
$= 1.000$
`2 step:` Finding a derivation of $x^{2.000}$
What if:
$(x^{2.000})' = ... =$ [top secret] $= ... =$
$= 2.000 \cdot x$
`3 step:` Finding a derivation of -1.000
It's really easy to find:
$(-1.000)' = ... =$ [top secret] $= ... =$
$= 0.000$
`4 step:` Finding a derivation of $\frac{(-1.000)}{x^{2.000}}$
Even my two-aged sister knows that:
$(\frac{(-1.000)}{x^{2.000}})' = ... =$ [top secret] $= ... =$
$= \frac{(-1.000)\cdot(-1.000)\cdot 2.000\cdot x}{(x^{2.000})^{2.000}}$
Finally... The 3 derivation of the expression:
$f^{(3)}$(x) = $\frac{(-1.000)\cdot(-1.000)\cdot 2.000\cdot x}{(x^{2.000})^{2.000}}$
BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 3 DERIVATION OF THIS EXPRESSION!!!
In the point $M_0(x_0) = (0.000)$ it's value = -nan

Finding partical derivations Partial derivation of the expression on the variable x:
$\frac{\partial f}{\partial x} = \frac{1.000}{x}$
In the point $M_0(x_0) = (0.000)$ it's value = inf !!!

Finding full derivation Full derivation:
$\sqrt{(\frac{1.000}{x})^{2.000}}$
In the point $M_0(x_0) = (0.000)$ it's value = inf !!!

Decomposing on Macloren's formula **Maklorens formula for** $x \to x_0 = 0.000$:
f(x) = $(-inf) + inf \cdot x + (-inf) \cdot x^{2.000} + ?(inf)? \cdot x^{3.000} + ?(inf)? \cdot x^{4.000} + ?(inf)? \cdot x^{5.000} + ?(inf)? \cdot x^{6.000}$+o($x^{6.000}$)

Graphics **Graph** f(x) = ln x on the diapasone $x \in [-10 : 10]$:



Equations in the point **Tangent equation** in the point $x_0 = 1.000$:

f(x) = $x - 1.000$

Normal equation in the point $x_0 = 1.000$:

f(x) = $(-1.000) \cdot (x - 1.000)$