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 $M_0(x_0) = (1.000)$ **it's value** = 0.00000

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:

$(x)' = ... = [\text{top secret}] = ... =$

$= 1.000$

`2 step:` Finding a derivation of $\ln x$

It's really easy to find:

$(\ln x)' = ... = [\text{top secret}] = ... =$

$= \frac{1.000}{x}$

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

$f'(x) = \frac{1.000}{x}$

In the point $M_0(x_0) = (1.000)$ it's value = 1.00000

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:

$(x)' = ... = [\text{top secret}] = ... =$

$= 1.000$

`2 step:` Finding a derivation of $\ln x$

Sounds logical that it is the same as:

$(\ln x)' = ... = [\text{top secret}] = ... =$

$= \frac{1.000}{x}$

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:

$(x)' = ... = [\text{top secret}] = ... =$

$= 1.000$

`2 step:` Finding a derivation of 1.000

Sounds logical that it is the same as:

$(1.000)' = ... = [\text{top secret}] = ... =$

$= 0.000$

`3 step:` Finding a derivation of $\frac{1.000}{x}$

It's really easy to find:

$(\frac{1.000}{x})' = ... = [\text{top secret}] = ... =$

$= \frac{(-1.000)\cdot 1.000}{x^{2.000}}$

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:

$(x)' = ... = [\text{top secret}] = ... =$

$= 1.000$

`2 step:` Finding a derivation of $x^{2.000}$

What if:

$(x^{2.000})' = ... = [\text{top secret}] = ... =$

$= 2.000 \cdot x$

`3 step:` Finding a derivation of -1.000

It's really easy to find:

$(-1.000)' = ... = [\text{top secret}] = ... =$

$= 0.000$

`4 step:` Finding a derivation of $\frac{(-1.000)}{x^{2.000}}$

Even my two-aged sister knows that:

$(\frac{(-1.000)}{x^{2.000}})' = ... = [\text{top secret}] = ... =$

$= \frac{(-1.000)\cdot(-1.000)\cdot 2.000\cdot x}{(x^{2.000})^{2.000}}$

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 $M_0(x_0) = (1.000)$ it's value = 2.00000

Finding partical derivations Partial derivation of the expression on the variable x:

$\frac{\partial f}{\partial x} = \frac{1.000}{x}$

In the point $M_0(x_0) = (1.000)$ it's value = 1.00000 !!!

Finding full derivation Full derivation:

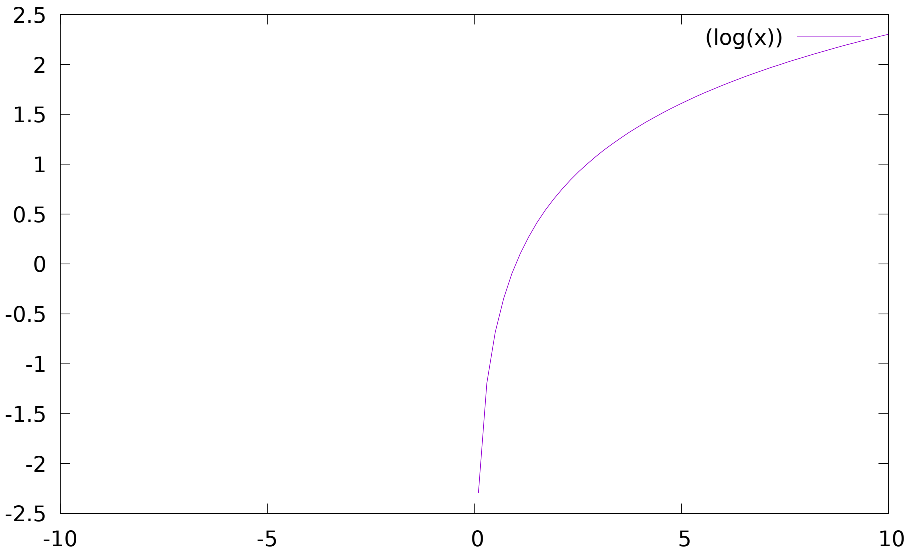
$\sqrt{(\frac{1.000}{x})^{2.000}}$

In the point $M_0(x_0) = (1.000)$ it's value = 1.00000 !!!

Decomposing on Macloren's formula **Maklorens formula for** $x \to x_0 = 1.000$:

$f(x) = x - 1.000 + (-0.500)\cdot(x-1.000)^{2.000} + 0.333\cdot(x-1.000)^{3.000} + (-0.250)\cdot(x-1.000)^{4.000} + 0.200\cdot(x-1.000)^{5.000} + (-0.167)\cdot(x-1.000)^{6.0}$

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