

1 Introduction

CrInGeCrInGeProduction.Supercringeintroductionhere :

2 Some basic knowledge about researching problem...

Parameters and constants we use in this work:

Constants (3):
e = 2.718282
pi = 3.141593
AbObA = 1337.228690
Variables (2):
x = 1.000000
opa = 13.000000
Parameters of exploration :
Number of differentiates : 2
Macloren's accuracy : 3
Tanget point : 0.200000
Delta coverage of tangent point: 2.500000
Graph diapason : [-1 : 15]
So let's calculate smth with a given function: f(x, opa) = ln (1.000 + x · opa)
Firstly, let's simplify this expression (if possible): f(x, opa) = ln (1.000 + x · opa)

3 Exploration of the expression as a function of multiple variables

Calculation value of function in the point BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!

In the point $M_0(x_0, opa_0) = (1.000, 13.000)$ it's value = 2.63906
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 opa
When I was child, my father always told me: "Remember, son:
(opa)' = ... = [top secret] = ... =
= 1.000
2 step: Finding a derivation of x
thanks to the results of my colleagues' scientific work, I know that:
(x)' = ... = [top secret] = ... =
= 1.000
3 step: Finding a derivation of x · opa
What if:
(x · opa)' = ... = [top secret] = ... =
= opa + x
4 step: Finding a derivation of 1.000
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
(1.000)' = ... = [top secret] = ... =
= 0.000
5 step: Finding a derivation of 1.000 + x · opa
It's really easy to find:
(1.000 + x · opa)' = ... = [top secret] = ... =
= opa + x
6 step: Finding a derivation of ln (1.000 + x · opa)
My friends always beat me, because I didn't know that:
(ln (1.000 + x · opa))' = ... = [top secret] = ... =
= $\frac{1.000}{1.000+x \cdot opa} \cdot (opa + x)$
Congratulations! The first derivation of the expression is:
f'(x, opa) = $\frac{1.000}{1.000+x \cdot opa} \cdot (opa + x)$
In the point $M_0(x_0, opa_0) = (1.000, 13.000)$ it's value = 1.00000

Finding the 2 derivation Let's find the 1 derivation of the expression:

1 step: Finding a derivation of opa
Sounds logical that it is the same as:
(opa)' = ... = [top secret] = ... =
= 1.000
2 step: Finding a derivation of x
My roommate mumbled it in his sleep all night:
(x)' = ... = [top secret] = ... =
= 1.000
3 step: Finding a derivation of x · opa
What if:
(x · opa)' = ... = [top secret] = ... =
= opa + x
4 step: Finding a derivation of 1.000
While preparing for exams, I learned a lot of new things, for example:
(1.000)' = ... = [top secret] = ... =
= 0.000
5 step: Finding a derivation of 1.000 + x · opa
Sounds logical that it is the same as:
(1.000 + x · opa)' = ... = [top secret] = ... =
= opa + x
6 step: Finding a derivation of ln (1.000 + x · opa)
I was asked not to tell anyone that:
(ln (1.000 + x · opa))' = ... = [top secret] = ... =
= $\frac{1.000}{1.000+x \cdot opa} \cdot (opa + x)$
Let's find the 2 derivation of the expression:
1 step: Finding a derivation of x
Even my two-aged sister knows that:
(x)' = ... = [top secret] = ... =
= 1.000
2 step: Finding a derivation of opa
I was asked not to tell anyone that:

$(opa)' = \dots = \text{[top secret]} = \dots =$
 = 1.000
3 step: Finding a derivation of $opa + x$
 If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $(opa + x)' = \dots = \text{[top secret]} = \dots =$
 = 2.000
4 step: Finding a derivation of opa
 thanks to the results of my colleagues' scientific work, I know that:
 $(opa)' = \dots = \text{[top secret]} = \dots =$
 = 1.000
5 step: Finding a derivation of x
 My roommate mumbled it in his sleep all night:
 $(x)' = \dots = \text{[top secret]} = \dots =$
 = 1.000
6 step: Finding a derivation of $x \cdot opa$
 Even my two-aged sister knows that:
 $(x \cdot opa)' = \dots = \text{[top secret]} = \dots =$
 = $opa + x$
7 step: Finding a derivation of 1.000
 Man... Just look:
 $(1.000)' = \dots = \text{[top secret]} = \dots =$
 = 0.000
8 step: Finding a derivation of $1.000 + x \cdot opa$
 For centuries, people have hunted for the secret knowledge that:
 $(1.000 + x \cdot opa)' = \dots = \text{[top secret]} = \dots =$
 = $opa + x$
9 step: Finding a derivation of 1.000
 I was asked not to tell anyone that:
 $(1.000)' = \dots = \text{[top secret]} = \dots =$
 = 0.000
10 step: Finding a derivation of $\frac{1.000}{1.000+x \cdot opa}$
 For centuries, people have hunted for the secret knowledge that:
 $(\frac{1.000}{1.000+x \cdot opa})' = \dots = \text{[top secret]} = \dots =$
 = $\frac{(-1.000) \cdot (opa+x)}{(1.000+x \cdot opa)^{2.000}}$
11 step: Finding a derivation of $\frac{1.000}{1.000+x \cdot opa} \cdot (opa + x)$
 When I was child, my father always told me: "Remember, son:
 $(\frac{1.000}{1.000+x \cdot opa} \cdot (opa + x))' = \dots = \text{[top secret]} = \dots =$
 = $\frac{(-1.000) \cdot (opa+x)}{(1.000+x \cdot opa)^{2.000}} \cdot (opa + x) + 2.000 \cdot \frac{1.000}{1.000+x \cdot opa}$
Finally... The 2 derivation of the expression:
 $f^{(2)}(x, opa) = \frac{(-1.000) \cdot (opa+x)}{(1.000+x \cdot opa)^{2.000}} \cdot (opa + x) + 2.000 \cdot \frac{1.000}{1.000+x \cdot opa}$
 BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 2 DERIVATION OF THIS EXPRESSION!!!
 In the point $M_0(x_0, opa_0) = (1.000, 13.000)$ it's value = -0.85714

Finding partical derivations Partial derivation of the expression on the variable x:
 $\frac{\partial f}{\partial x} = 13.000 \cdot \frac{1.000}{1.000+13.000 \cdot x}$
 In the point $M_0(x_0, opa_0) = (1.000, 13.000)$ it's value = 0.92857 !!!
 Partial derivation of the expression on the variable opa:
 $\frac{\partial f}{\partial opa} = \frac{1.000}{1.000+opa}$
 In the point $M_0(x_0, opa_0) = (1.000, 13.000)$ it's value = 0.07143 !!!

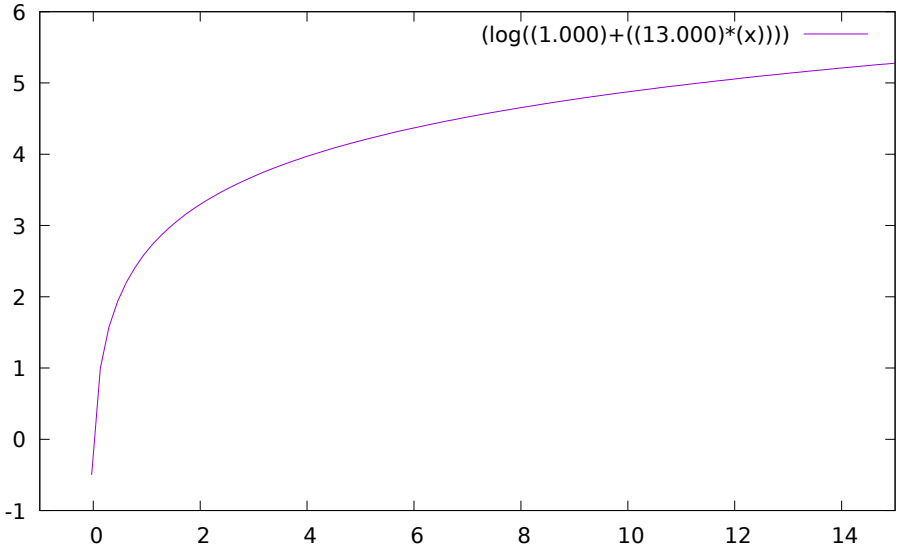
Finding full derivation Full derivation:
 $\sqrt{(13.000 \cdot \frac{1.000}{1.000+13.000 \cdot x})^{2.000} + (\frac{1.000}{1.000+opa})^{2.000}}$
 In the point $M_0(x_0, opa_0) = (1.000, 13.000)$ it's value = 0.93131 !!!

4 Exploration the expression as a function of the first variable

Now let's consider the expression as a function of x variable: $f(x) = \ln(1.000 + 13.000 \cdot x)$

Decomposing on Macloren's formula **Maklorems formula for** $x \rightarrow x_0 = 1.000$:
 $f(x) = 2.639 + 0.929 \cdot (x - 1.000) + (-0.431) \cdot (x - 1.000)^{2.000} + 0.267 \cdot (x - 1.000)^{3.000} + o((x - 1.000)^{3.000})$

Graphics **Graph** $f(x) = \ln(1.000 + 13.000 \cdot x)$ on the diapasone $x \in [-1 : 15]$:



Equations in the point **Tangent equation** in the point $x_0 = 0.200$:

$f(x) = 3.611 \cdot (x - 0.200) + 1.281$

Normal equation in the point $x_0 = 0.200$:

$f(x) = (-0.277) \cdot (x - 0.200) + 1.281$

Their graphs in $\delta = 2.50000$ coverage of the point $x_0 = 0.200000$

