## 1 Introduction

CrIn GeCrIn GeProduction. Supercringe introduction here:

# 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 (3):
   a = 3.141500
   \text{kek} = 13.000000
   x = 1.000000
Parameters of exploration:
   Number of differentiates = 2
   Macloren's accuracy = 3
   \underline{\text{Tanget point}} = 0.200000
   Delta coverage of tangent point = 2.500000
   Graph\ diapasone = [-1:15]
So let's calculate smth with a given function:
    f(a, kek, x) = \cos\left(a + \frac{kek}{1.000^{AbObA}}\right) + \ln\left(1.000 + x \cdot kek \cdot (1.000^{(\ln e)} - 0.000)\right)
Firstly, let's insert all constants:
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And simplify this expression (if possible):

```
f(a, kek, x) = \cos(a + kek) + \ln(1.000 + x \cdot kek)
```

## 3 Exploration the expression as a function of multiple variables

#### - Calculation a value of function in the point

```
BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!! In the point M_0(a_0, kek_0, x_0) = (3.142, 13.000, 1.000) expression's value = 1.73157
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 $f(a, kek, x) = \cos\left(a + \frac{kek}{1.000^{1337.229}}\right) + \ln\left(1.000 + x \cdot kek \cdot (1.000^{(\ln 2.718)} - 0.000)\right)$ 

#### - 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 kek
While preparing for exams, I learned a lot of new things, for example:
(kek)' =
= 1.000
2 step: Finding a derivation of x
Only after two cups of beer you might understand it:
(x)' =
= 1.000
3 step: Finding a derivation of x \cdot kek
Never say it to girls:
(x \cdot kek)' =
= kek + x
4 step: Finding a derivation of 1.000
Only by using special skills we might know::
(1.000)' = \dots = [top secret] = \dots =
= 0.000
5 step: Finding a derivation of 1.000 + x \cdot kek
What if:
```

 $(1.000 + x \cdot kek)' =$ 

= kek + x

Even my two-aged sister knows that:  $(\ln(1.000 + x \cdot kek))' =$  $= \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)$ 7 step: Finding a derivation of kek The first task in MIPT was to calculate: (kek)' == 1.0008 step: Finding a derivation of a Never say it to girls: (a)' == 1.0009 step: Finding a derivation of a + kekIt's simple as fuck:  $(a + kek)' = \dots = [top secret] = \dots =$ = 2.00010 step: Finding a derivation of  $\cos(a + kek)$ As we know:  $(\cos\left(a + kek\right))' =$  $= 2.000 \cdot (-1.000) \cdot \sin(a + kek)$ 11 step: Finding a derivation of  $\cos(a + kek) + \ln(1.000 + x \cdot kek)$ I was asked not to tell anyone that:  $(\cos(a + kek) + \ln(1.000 + x \cdot kek))' =$ =  $2.000 \cdot (-1.000) \cdot \sin(a + kek) + \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)$ Congratulations! The first derivation of the expression is: f'(a, kek, x) =  $2.000 \cdot (-1.000) \cdot \sin(a + kek) + \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)$ In the point  $M_0(a_0, kek_0, x_0) = (3.142, 13.000, 1.000)$  it's value = 1.84017 - Finding the 2 derivation Let's find the 1 derivation of the expression: 1 step: Finding a derivation of kekOnly after two cups of beer you might understand it:  $(kek)' = \dots = [top secret] = \dots =$ = 1.0002 step: Finding a derivation of xEven my two-aged sister knows that: (x)' == 1.0003 step: Finding a derivation of  $x \cdot kek$ Even my two-aged sister knows that:  $(x \cdot kek)' =$ = kek + x4 step: Finding a derivation of 1.000 When I was a child, my father always told me: "Remember, son: (1.000)' == 0.000

6 step: Finding a derivation of  $\ln (1.000 + x \cdot kek)$ 

5 step: Finding a derivation of  $1.000 + x \cdot kek$ 

I have no words to describe this fact:

$$(1.000 + x \cdot kek)' = \dots = [\text{top secret}] = \dots =$$

= kek + x

6 step: Finding a derivation of  $\ln(1.000 + x \cdot kek)$ My roommate mumbled it in his sleep all night:

$$(\ln (1.000 + x \cdot kek))' = \dots = [\text{top secret}] = \dots =$$

$$= \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)$$

7 step: Finding a derivation of kek I have no words to describe this fact:

$$(kek)' = \dots = [top secret] = \dots =$$

= 1.000

8 step: Finding a derivation of a

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

$$(a)' =$$

= 1.000

9 step: Finding a derivation of a + kek It's really easy to find:

$$(a + kek)' =$$

= 2.000

10 step: Finding a derivation of  $\cos(a + kek)$ 

What if:

$$(\cos(a+kek))' = \dots = [\text{top secret}] = \dots =$$

$$= 2.000 \cdot (-1.000) \cdot \sin{(a + kek)}$$

11 step: Finding a derivation of  $\cos{(a+kek)} + \ln{(1.000+x\cdot kek)}$ You should be aware of the fact that:

$$(\cos{(a+kek)} + \ln{(1.000 + x \cdot kek)})' =$$

= 
$$2.000 \cdot (-1.000) \cdot \sin(a + kek) + \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)$$

So the 1 derivation of the expression is:

$$2.000 \cdot (-1.000) \cdot \sin{(a + kek)} + \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)$$

Let's find the 2 derivation of the expression:

1 step: Finding a derivation of x A true prince must know that:

$$(x)' =$$

= 1.000

2 step: Finding a derivation of kek

For centuries, people have hunted for the secret knowledge that:

$$(kek)' =$$

= 1.000

3 step: Finding a derivation of kek + x

I spend the hole of my life to find the answer and finally it's:

$$(kek + x)' = \dots = [top secret] = \dots =$$

= 2.000

4 step: Finding a derivation of kek

Never say it to girls:

(kek)' =

= 1.000

5 step: Finding a derivation of x It's really easy to find:

(x)' =

= 1.000

6 step: Finding a derivation of  $x \cdot kek$ 

Sometimes I hear the same voice in my head, it always says:

$$(x \cdot kek)' = \dots = [top secret] = \dots =$$

= kek + x

7 step: Finding a derivation of 1.000 Even my two-aged sister knows that:

(1.000)' =

= 0.000

8 step: Finding a derivation of  $1.000 + x \cdot kek$ Only by using special skills we might know::

$$(1.000 + x \cdot kek)' =$$

= kek + x

9 step: Finding a derivation of 1.000

My friends always beat me, because I didn't know that:

$$(1.000)' = \dots = [top secret] = \dots =$$

= 0.000

10 step: Finding a derivation of  $\frac{1.000}{1.000+x\cdot kek}$  A true prince must know that:

$$(\frac{1.000}{1.000 + x \cdot kek})' = \dots = [\text{top secret}] = \dots =$$

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

11 step: Finding a derivation of  $\frac{1.000}{1.000+x\cdot kek}\cdot (kek+x)$  Sometimes I hear the same voice in my head, it always says:

Sometimes I hear the same voice in my head, it always 
$$\left(\frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)\right)' =$$

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

12 step: Finding a derivation of kek

Only by using special skills we might know::

$$(kek)' = \dots = [\mathbf{top} \ \mathbf{secret}] = \dots =$$

= 1.000

13 step: Finding a derivation of a

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

$$(a)' =$$

= 1.000

14 step: Finding a derivation of a + kek

She: please, never speak with my dad about math... Me: ok) Also me after homework of matan:

$$(a + kek)' = \dots = [\mathbf{top} \ \mathbf{secret}] = \dots =$$

= 2.000

15 step: Finding a derivation of  $\sin(a + kek)$ 

My roommate mumbled it in his sleep all night:

$$(\sin(a+kek))' = \dots = [\text{top secret}] = \dots =$$

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= 2.000 \cdot \cos\left(a + kek\right)
16 step: Finding a derivation of -1.000
A true prince must know that:
(-1.000)' = \dots = [\text{top secret}] = \dots =
= 0.000
17 step: Finding a derivation of (-1.000) \cdot \sin(a + kek)
A true prince must know that:
((-1.000) \cdot \sin(a + kek))' =
= (-1.000) \cdot 2.000 \cdot \cos(a + kek)
18 step: Finding a derivation of 2.000
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
(2.000)' =
= 0.000
19 step: Finding a derivation of 2.000 \cdot (-1.000) \cdot \sin(a + kek)
When I was a child, my father always told me: "Remember, son:
(2.000 \cdot (-1.000) \cdot \sin(a + kek))' = \dots = [\text{top secret}] = \dots =
= 2.000 \cdot (-1.000) \cdot 2.000 \cdot \cos(a + kek)
20 step: Finding a derivation of 2.000 \cdot (-1.000) \cdot \sin{(a + kek)} + \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x)
thanks to the results of my colleagues' scientific work, I know that:
(2.000 \cdot (-1.000) \cdot \sin(a + kek) + \frac{1.000}{1.000 + x \cdot kek} \cdot (kek + x))' =
=2.000\cdot(-1.000)\cdot2.000\cdot\cos\left(a+kek\right)+\tfrac{(-1.000)\cdot(kek+x)}{(1.000+x\cdot kek)^{2.000}}\cdot(kek+x)+2.000\cdot\tfrac{1.000}{1.000+x\cdot kek}
So the 2 derivation of the expression is:
          2.000 \cdot (-1.000) \cdot 2.000 \cdot \cos{(a+kek)} + \frac{(-1.000) \cdot (kek+x)}{(1.000+x \cdot kek)^{2.000}} \cdot (kek+x) + 2.000 \cdot \frac{1.000}{1.000+x \cdot kek} + \frac{(-1.000) \cdot (kek+x)}{(1.000+x \cdot kek)^{2.000}} \cdot (kek+x) + 2.000 \cdot \frac{1.000}{(1.000+x \cdot kek)^{2.000}} \cdot (kek+x) + 2.000 \cdot \frac{1.000}
Finally... The 2 derivation of the expression:
         f^{(2)}(a, \text{ kek, x}) = 2.000 \cdot (-1.000) \cdot 2.000 \cdot \cos{(a + kek)} + \frac{(-1.000) \cdot (kek + x)}{(1.000 + x \cdot kek)^{2.000}} \cdot (kek + x) + 2.000 \cdot \frac{1.000}{1.000 + x \cdot kek} BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 2 DERIVATION OF THIS EXPRESSION!!!
         In the point M_0(a_0, kek_0, x_0) = (3.142, 13.000, 1.000) it's value = 2.77280
Finding partical derivations Partial derivation of the expression on the variable a:
          \frac{\partial f}{\partial a} = (-1.000) \cdot \sin\left(a + 13.000\right)
         In the point M_0(a_0, kek_0, x_0) = (3.142, 13.000, 1.000) it's value = 0.42008 !!!
         Partial derivation of the expression on the variable kek:
         \frac{\partial f}{\partial kek} = (-1.000) \cdot \sin(3.142 + kek) + \frac{1.000}{1.000 + kek}
In the point M_0(a_0, kek_0, x_0) = (3.142, 13.000, 1.000) it's value = 0.49151 !!!
```

# Finding full derivation Full derivation:

Partial derivation of the expression on the variable x:

```
\sqrt{\left((-1.000) \cdot \sin\left(a + 13.000\right)\right)^{2.000} + \left((-1.000) \cdot \sin\left(3.142 + kek\right) + \frac{1.000}{1.000 + kek}\right)^{2.000} + \left(13.000 \cdot \frac{1.000}{1.000 + 13.000 \cdot x}\right)^{2.000}}
In the point M_0(a_0, kek_0, x_0) = (3.142, 13.000, 1.000) it's value = 1.13150 !!!
```

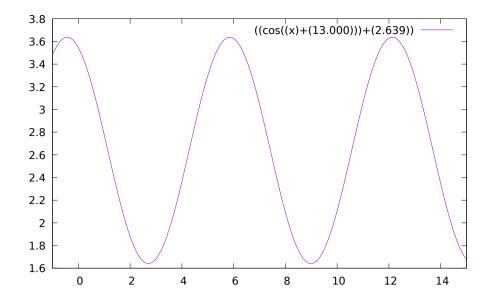
### 4 Exploration the expression as a function of the first variable

Now let's consider the expression as a function of the first variable a:  $f(a) = \cos(a + 13.000) + 2.639$ 

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Decomposing on Macloren's formula Maklorens formula for a \rightarrow a_0 = 3.142: f(a) = 1.732 + 0.420 \cdot (a - 3.142) + 0.454 \cdot (a - 3.142)^{2.000} + (-0.070) \cdot (a - 3.142)^{3.000} + o((a - 3.142)^{3.000})
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**Graphics** Graph  $f(a) = \cos(a + 13.000) + 2.639$  on the diapasone  $a \in [-1:15]$ :

 $\frac{\partial f}{\partial x}=13.000\cdot\frac{1.000}{1.000+13.000\cdot x}$  In the point  $M_0(a_0,\,kek_0,\,x_0)=(3.142,\,13.000,\,1.000)$  it's value = 0.92857 !!!



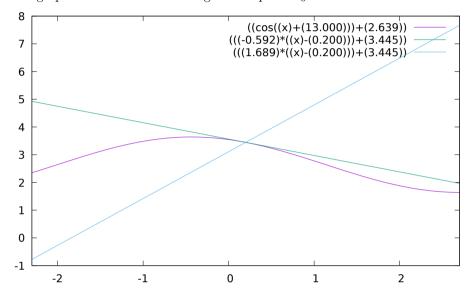
## Equations in the point Tangent equation in the point $a_0 = 0.200$ :

 $f(a) = (-0.592) \cdot (a - 0.200) + 3.445$ 

**Normal equation** in the point  $a_0 = 0.200$ :

 $f(a) = 1.689 \cdot (a - 0.200) + 3.445$ 

Their graphs in  $\delta = 2.50000$  coverage of the point  $a_0 = 0.200000$ 



## 5 Conclusion

Ultrar cringe conclusion here: