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 (3):
kek = 13.000000
a = 3.141500
x = 1.000000

Parameters of exploration :
Number of differentiates = 2
Macloren's accuracy = 3
Tanget point = 0.000000
Delta coverage of tangent point = 0.500000
Graph diapasone = $[-2 : 2]$

So let's calculate smth with a given function:

$$\text{f(kek, a, x)} = \cos kek \cdot a \cdot x^2 - \tan \frac{kek}{e}$$

Firstly, let's insert all constants:

$$\text{f(kek, a, x)} = \cos kek \cdot a \cdot x^2 - \tan \frac{kek}{2.71828}$$

3 Exploration of 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 $M_0(kek_0, a_0, x_0) = (13.000, 3.142, 1.000)$ expression's value = 17.10418

- 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 2.71828

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

$(2.71828)' =$

$= 0$

`2 step:` Finding a derivation of kek

Only after two cups of beer you might understand it:

$(kek)' =$

$= 1$

`3 step:` Finding a derivation of $\frac{kek}{2.71828}$

Never say it to girls:

$(\frac{kek}{2.71828})' =$

$= \frac{2.71828}{7.38906}$

`4 step:` Finding a derivation of $\tan \frac{kek}{2.71828}$

Only by using special skills we might know::

$(\tan \frac{kek}{2.71828})' =$ **... = [top secret] = ...** $=$

$= 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

`5 step:` Finding a derivation of x

What if:

$(x)' =$

$= 1$

`6 step:` Finding a derivation of x^2

Even my two-aged sister knows that:

$(x^2)' =$

$= 2 \cdot x$

`7 step:` Finding a derivation of a

The first task in MIPT was to calculate:

$(a)' =$

$= 1$

`8 step:` Finding a derivation of kek

Never say it to girls:

$(kek)' =$

$= 1$

`9 step:` Finding a derivation of $\cos kek$

It's simple as fuck:

$(\cos kek)' =$ **... = [top secret] = ...** $=$

$= (-1) \cdot \sin kek$

`10 step:` Finding a derivation of $\cos kek \cdot a$

As we know:

$(\cos kek \cdot a)' =$

$= (-1) \cdot \sin kek \cdot a + \cos kek$

`11 step:` Finding a derivation of $\cos kek \cdot a \cdot x^2$

I was asked not to tell anyone that:

$(\cos kek \cdot a \cdot x^2)' =$

$= ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a$

`12 step:` Finding a derivation of $\cos kek \cdot a \cdot x^2 - \tan \frac{kek}{2.71828}$

Only after two cups of beer you might understand it:

$(\cos kek \cdot a \cdot x^2 - \tan \frac{kek}{2.71828})' =$ **... = [top secret] = ...** $=$

$= (((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a) - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

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

$\mathrm{f}'(\mathrm{kek},\ \mathrm{a},\ \mathrm{x}) = (((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a) - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

In the point $M_0(kek_0,\ a_0,\ x_0) = (13.000,\ 3.142,\ 1.000)$ **it's value = -69.81743**

- Finding the 2 derivation

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

`1 step:` Finding a derivation of 2.71828

Even my two-aged sister knows that:

$(2.71828)' =$

$= 0$

`2 step:` Finding a derivation of kek

Even my two-aged sister knows that:

$(kek)' =$

$= 1$

`3 step:` Finding a derivation of $\frac{kek}{2.71828}$

When I was a child, my father always told me: "Remember, son:

$(\frac{kek}{2.71828})' =$

$= \frac{2.71828}{7.38906}$

`4 step:` Finding a derivation of $\tan \frac{kek}{2.71828}$

I have no words to describe this fact:

$(\tan \frac{kek}{2.71828})' =$ **... = [top secret] = ...** $=$

$= 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

`5 step:` Finding a derivation of x

My roommate mumbled it in his sleep all night:

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

$= 1$

`6 step:` Finding a derivation of x^2

I have no words to describe this fact:

$(x^2)' =$ **... = [top secret] = ...** $=$

$= 2 \cdot x$

`7 step:` Finding a derivation of a

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

$(a)' =$

$= 1$

`8 step:` Finding a derivation of kek

It's really easy to find:

$(kek)' =$

$= 1$

`9 step:` Finding a derivation of $\cos kek$

What if:

$(\cos kek)' =$ **... = [top secret] = ...** $=$

$= (-1) \cdot \sin kek$

`10 step:` Finding a derivation of $\cos kek \cdot a$

You should be aware of the fact that:

$(\cos kek \cdot a)' =$

$= (-1) \cdot \sin kek \cdot a + \cos kek$

`11 step:` Finding a derivation of $\cos kek \cdot a \cdot x^2$

A true prince must know that:

$(\cos kek \cdot a \cdot x^2)' =$

$= ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a$

`12 step:` Finding a derivation of $\cos kek \cdot a \cdot x^2 - \tan \frac{kek}{2.71828}$

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

$(\cos kek \cdot a \cdot x^2 - \tan \frac{kek}{2.71828})' =$

$= (((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a) - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

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

$$(((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a) - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$$

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

`1 step:` Finding a derivation of 2.71828

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

$(2.71828)' =$ **... = [top secret] = ...** $=$

$= 0$

`2 step:` Finding a derivation of kek

Never say it to girls:

$(kek)' =$

$= 1$

`3 step:` Finding a derivation of $\frac{kek}{2.71828}$

It's really easy to find:

$(\frac{kek}{2.71828})' =$

$= \frac{2.71828}{7.38906}$

`4 step:` Finding a derivation of $\cos \frac{kek}{2.71828}$

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

$(\cos \frac{kek}{2.71828})' =$ **... = [top secret] = ...** $=$

$= 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}$

`5 step:` Finding a derivation of $(\cos \frac{kek}{2.71828})^2$

Even my two-aged sister knows that:

$((\cos \frac{kek}{2.71828})^2)' =$

$= 2 \cdot \cos \frac{kek}{2.71828} \cdot 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}$

`6 step:` Finding a derivation of 1

Only by using special skills we might know::

$(1)' =$

$= 0$

`7 step:` Finding a derivation of $\frac{1}{(\cos \frac{kek}{2.71828})^2}$

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

$(\frac{1}{(\cos \frac{kek}{2.71828})^2})' =$ **... = [top secret] = ...** $=$

$= \frac{(-1) \cdot 2 \cdot \cos \frac{kek}{2.71828} \cdot 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}}{((\cos \frac{kek}{2.71828})^2)^2}$

`8 step:` Finding a derivation of 0.367879

A true prince must know that:

$(0.367879)' =$ **... = [top secret] = ...** $=$

$= 0$

`9 step:` Finding a derivation of $0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

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

$(0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2})' =$

$= 0.367879 \cdot \frac{(-1) \cdot 2 \cdot \cos \frac{kek}{2.71828} \cdot 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}}{((\cos \frac{kek}{2.71828})^2)^2}$

`10 step:` Finding a derivation of a

Only by using special skills we might know::

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

$= 1$

`11 step:` Finding a derivation of kek

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

$(kek)' =$

$= 1$

12 step: Finding a derivation of $\cos kek$

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

$(\cos kek)' = \ldots = [\text{top secret}] = \ldots =$

$= (-1) \cdot \sin kek$

13 step: Finding a derivation of $\cos kek \cdot a$

My roommate mumbled it in his sleep all night:

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

$= (-1) \cdot \sin kek \cdot a + \cos kek$

14 step: Finding a derivation of x

A true prince must know that:

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

$= 1$

15 step: Finding a derivation of 2

A true prince must know that:

$(2)' =$

$= 0$

16 step: Finding a derivation of $2 \cdot x$

If someone asked me that in the middle of the night, I wouldn't hesitate to say:

$(2 \cdot x)' =$

$= 2$

17 step: Finding a derivation of $2 \cdot x \cdot \cos kek \cdot a$

When I was a child, my father always told me: "Remember, son:

$(2 \cdot x \cdot \cos kek \cdot a)' = \ldots = [\text{top secret}] = \ldots =$

$= 2 \cdot \cos kek \cdot a + ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot 2 \cdot x$

18 step: Finding a derivation of x

thanks to the results of my colleagues' scientific work, I know that:

$(x)' =$

$= 1$

19 step: Finding a derivation of x^2

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

$(x^2)' = \ldots = [\text{top secret}] = \ldots =$

$= 2 \cdot x$

20 step: Finding a derivation of kek

If someone asked me that in the middle of the night, I wouldn't hesitate to say:

$(kek)' =$

$= 1$

21 step: Finding a derivation of $\cos kek$

A true prince must know that:

$(\cos kek)' =$

$= (-1) \cdot \sin kek$

22 step: Finding a derivation of a

My roommate mumbled it in his sleep all night:

$(a)' = \ldots = [\text{top secret}] = \ldots =$

$= 1$

23 step: Finding a derivation of kek

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

$(kek)' = \ldots = [\text{top secret}] = \ldots =$

$= 1$

24 step: Finding a derivation of $\sin kek$

It was a tragic moment when I learned it on matan exam:

$(\sin kek)' =$

$= \cos kek$

25 step: Finding a derivation of -1

Only by using special skills we might know::

$(-1)' = \ldots = [\text{top secret}] = \ldots =$

$= 0$

26 step: Finding a derivation of $(-1) \cdot \sin kek$

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

$((-1) \cdot \sin kek)' =$

$= (-1) \cdot \cos kek$

`27 step:` Finding a derivation of $(-1) \cdot \sin kek \cdot a$

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

$((-1) \cdot \sin kek \cdot a)' =$

$= (-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek$

`28 step:` Finding a derivation of $(-1) \cdot \sin kek \cdot a + \cos kek$

A true prince must know that:

$((-1) \cdot \sin kek \cdot a + \cos kek)' =$

$= (-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek + (-1) \cdot \sin kek$

`29 step:` Finding a derivation of $((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2$

Lol, i remember that:

$(((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2)' =$ **... = [top secret] = ...** $=$

$= ((-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek + (-1) \cdot \sin kek) \cdot x^2 + 2 \cdot x \cdot ((-1) \cdot \sin kek \cdot a + \cos kek)$

`30 step:` Finding a derivation of $((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a$

Lol, i remember that:

$(((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a)' =$

$= ((-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek + (-1) \cdot \sin kek) \cdot x^2 + 2 \cdot x \cdot ((-1) \cdot \sin kek \cdot a + \cos kek) + 2 \cdot \cos kek \cdot a + ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot 2 \cdot x$

`31 step:` Finding a derivation of $(((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a) - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

Only after two cups of beer you might understand it:

$((((-1) \cdot \sin kek \cdot a + \cos kek) \cdot x^2 + 2 \cdot x \cdot \cos kek \cdot a) - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2})' =$ **... = [top secret] = ...** $=$

$= (((-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek + (-1) \cdot \sin kek) \cdot x^2 + 2 \cdot x \cdot ((-1) \cdot \sin kek \cdot a + \cos kek) + 2 \cdot \cos kek \cdot a + ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot 2 \cdot x) - 0.367879 \cdot \frac{(-1) \cdot 2 \cdot \cos \frac{kek}{2.71828} \cdot 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}}{((\cos \frac{kek}{2.71828})^2)^2}$

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

$$(((-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek + (-1) \cdot \sin kek) \cdot x^2 + 2 \cdot x \cdot ((-1) \cdot \sin kek \cdot a + \cos kek) + 2 \cdot \cos kek \cdot a + ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot 2 \cdot x) - 0.367879 \cdot \frac{(-1) \cdot 2 \cdot \cos \frac{kek}{2.71828} \cdot 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}}{((\cos \frac{kek}{2.71828})^2)^2}$$

Finally... The 2 derivation of the expression:

$$f^{(2)}(\text{kek, a, x}) = (((-1) \cdot \cos kek \cdot a + (-1) \cdot \sin kek + (-1) \cdot \sin kek) \cdot x^2 + 2 \cdot x \cdot ((-1) \cdot \sin kek \cdot a + \cos kek) + 2 \cdot \cos kek \cdot a + ((-1) \cdot \sin kek \cdot a + \cos kek) \cdot 2 \cdot x) - 0.367879 \cdot \frac{(-1) \cdot 2 \cdot \cos \frac{kek}{2.71828} \cdot 0.367879 \cdot (-1) \cdot \sin \frac{kek}{2.71828}}{((\cos \frac{kek}{2.71828})^2)^2}$$

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

In the point $M_0(kek_0, a_0, x_0) = (13.000, 3.142, 1.000)$ **it's value = 788.00817**

- Finding partical derivations

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

$\frac{\partial f}{\partial kek} = 3.1415 \cdot (-1) \cdot \sin kek - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2}$

In the point $M_0(kek_0, a_0, x_0) = (13.000, 3.142, 1.000)$ **it's value = -76.42637** !!!

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

$\frac{\partial f}{\partial a} = 0.907447$

In the point $M_0(kek_0, a_0, x_0) = (13.000, 3.142, 1.000)$ **it's value = 0.90745** !!!

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

$\frac{\partial f}{\partial x} = 2.85074 \cdot 2 \cdot x$

In the point $M_0(kek_0, a_0, x_0) = (13.000, 3.142, 1.000)$ **it's value = 5.70149** !!!

- Finding full derivation

Full derivation:

$$\sqrt{(3.1415 \cdot (-1) \cdot \sin kek - 0.367879 \cdot \frac{1}{(\cos \frac{kek}{2.71828})^2})^2 + 0.82346 + (2.85074 \cdot 2 \cdot x)^2}$$

In the point $M_0(kek_0, a_0, x_0) = (13.000, 3.142, 1.000)$ **it's value = 76.64411** !!!

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

In this part of the article let's consider the expression as a function of the first variable kek:

$$\text{f(kek)} = 3.1415 \cdot \cos kek - \tan \frac{kek}{2.71828}$$

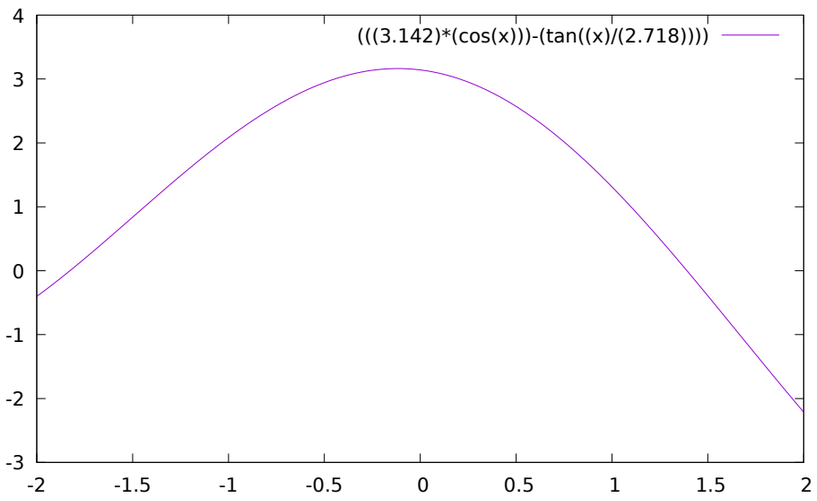
- Decomposing on Macloren's formula

First 3 members of Maklorens decomposition for $kek \to kek_0 = 13.000$:

$$\text{f(kek)} = 17.1042 + (-76.4264) \cdot (kek - 13) + 392.399 \cdot (kek - 13)^2 + (-2068.2) \cdot (kek - 13)^3 + \text{o}((kek - 13)^3)$$

- Graphics

Graph of $\text{f(kek)} = 3.1415 \cdot \cos kek - \tan \frac{kek}{2.71828}$ on the diapasone $kek \in [-2 : 2]$:

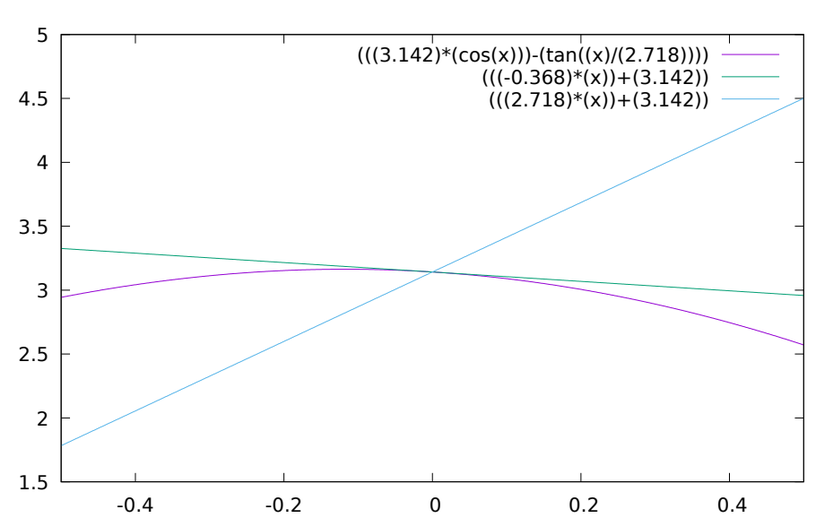


- Equations in the point

Tangent equation in $kek_0 = 0.000$:
$\mathrm{f(kek)} = (-0.367879) \cdot kek + 3.1415$

Normal equation in $kek_0 = 0.00000$:
$\mathrm{f(kek)} = 2.71828 \cdot kek + 3.1415$

Their graphs in $\delta = 0.500$ coverage of the point $kek_0 = 0.000$:



5 Conclusion

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

Repository of the author
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