New approaches to derivative analysis

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1 Introduction

In this paper we discuss several new approaches to finding function derivatives. Many people, and even mathematicians, would say that is a trick, because it gives you a huge boost in productivity. Honor programming!

2 Example

Let's consider an example of finding a derivative in an expression that normal universities would call brutal $(((x+\ln x))^{\cos(x)^{\tan x}})'$

Consequently, $(x)' \to 1$

What shall we do with this?? $(x)' \to 1$

Even hedgehog knows that $(\ln x)' \to \frac{1}{x}$

Hence, $((x+\ln x))' \to (1+\frac{1}{x})$

If all else fails, read the well-known book K and R: $(x)' \to 1$

Make that equation great again! $(x)' \to 1$

Just take it simple: $(\tan x)' \to \frac{1}{(\cos x)^2} * 1$

Even hedgehog knows that $((x)^{\tan x})' \to (x)^{\tan x} * (\frac{1}{x} * \tan x + \ln x * \frac{1}{(\cos x)^2} * 1)$

We suggest to hope that with the help of god it will later be slashed out $(\cos(x)^{\tan x})' \to (0 - \sin(x)^{\tan x} * (x)^{\tan x} * (\frac{1}{x} * \tan x + \ln x * \frac{1}{(\cos x)^2} * 1))$

What shall we do with this?? $(((x+\ln x))^{\cos(x)^{\tan x}})' \to ((x+\ln x))^{\cos(x)^{\tan x}} * (\frac{(1+\frac{1}{x})}{(x+\ln x)} * \cos(x)^{\tan x} + \ln(x+\ln x) * (0 - \sin(x)^{\tan x} * (x)^{\tan x} * (\frac{1}{x} * \tan x + \ln x * \frac{1}{(\cos x)^2} * 1)))$

Hence, $\to ((x+\ln x))^{\cos(x)^{\tan x}} * (\frac{(1+\frac{1}{x})}{(x+\ln x)} * \cos(x)^{\tan x} + \ln(x+\ln x) * (0 - \sin(x)^{\tan x} * (x)^{\tan x} * (\frac{1}{x} * \tan x + \ln x * \frac{1}{(\cos x)^2})))$

All in all, the derivative of this crocodile: $(((x+\ln x))^{\cos(x)^{\tan x}})'$

$\rightarrow ((x + \ln x))^{\cos (x)^{\tan x}} * (\frac{(1+\frac{1}{x})}{(x+\ln x)} * \cos (x)^{\tan x} + \ln (x + \ln x) * (0 - \sin (x)^{\tan x} * (x)^{\tan x} * (\frac{1}{x} * \tan x + \ln x * \frac{1}{(\cos x)^2})))$

3 Conclusion

In previous sections we modestly discussed different techniques, which make differentiation quite easy and even intuitively understandable. Of course, this brief leaflet should be considered only as an introduction to new methods of derivative analysis.

4 References

[1] Kudrinsky, Alexey M. New approaches to derivative analysis. ACM Press, Perm, 2019.