

MIPT 2020 presents
 «Bad mathematician taking derivatives»
 © Annna Savchuk

Introduction

My name is Anna Savchuk and in this paper I will present to caring reader the process of artificial intelligence training to calculate derivatives. The problems of calculating difficult expression is widely spread specially among the first year students, so as their representative I decided to make a program that will be able to differentiate and easily simplify mathematical expressions.

Let's find derivative for this expression:

$$\left(\frac{x}{(x+56)}\right)^a$$

where a is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

We pretend that we can count derivatives:

My name is Anya Savchuk but my dept calls me to calculate derivatives

So, I'll try to simplify it, let's believe in my success

$$2.71828^{a \cdot b} \cdot \left((c)'(d) \cdot \left(\left(\frac{e}{f}\right) \cdot \right) + \right)$$

where a is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

where b is

$$\log\left(\frac{x}{(x+56)}\right)$$

where c is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

where d is

$$\log\left(\frac{x}{(x+56)}\right)$$

where e is

$$\left(\frac{x}{(x+56)}\right)' \left(\frac{x}{(x+56)}\right)$$

where f is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

Final derivative is:

$$\left(a \cdot \left(\frac{x}{(x+56)}\right)\right) \cdot \left((b)'(c) \cdot \left(\left(\frac{d}{e}\right) \cdot \right) + \right)$$

where a is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

where b is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

where c is

$$\log\left(\frac{x}{(x+56)}\right)$$

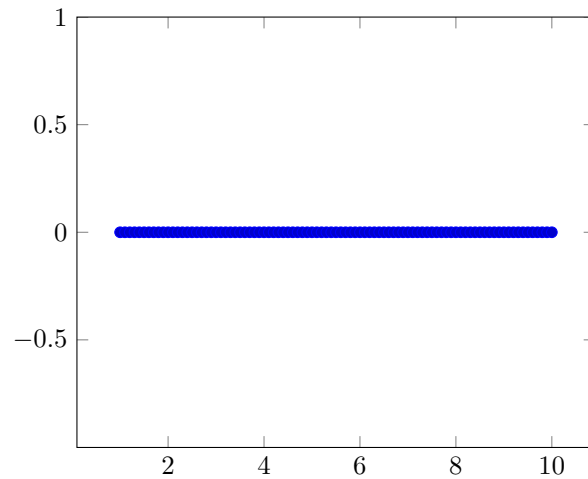
where d is

$$\left(\frac{x}{(x+56)}\right)' \left(\frac{x}{(x+56)}\right)$$

where e is

$$\sin\left((x+78) \cdot \sqrt{x^{\frac{x}{42}}}\right)$$

Let's see how does it look like:



My references:

- Field for experiments
<https://github.com/s-a-v-a-n-n-a/Differentiator>
- Lections by Redkozubov V.V.
<https://www.youtube.com/playlist?list=PLthfp5exSWEoItZUXCG3Bhrn3AFzw8AKK>