"What to say in front of the blackboard" - a brief tutorial

Exercise: Calculate the derivative of $\ln(e^{2x}+e^{x}+e)$

$$\left[\ln(e^{2x}+e^{x}+e)\right]' = \frac{1}{e^{2x}+e^{x}+e}\cdot(2e^{2x}+e^{x}) = \frac{2e^{2x}+e^{x}}{e^{2x}+e^{x}+e}$$

the derivative of the natural logarithm of e to the power of two x plus e to the power of x plus e

First of all, we had to write the derivative of outer function the natural logarithm, which is one over its argument

next, we had to calculate the derivative of the inner function, which is e to the power of two x plus e to the power of x plus e

Finally, we obtain a simplified result

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Excercise: calculate the derivative of $\log_4(x^4)$

$$\left[\log_4(x^4)\right]' = \frac{1}{x^4 \ln 4} \cdot (4x^3) = \frac{4}{x \ln 4}$$

the derivative of logarithm with base 4 of x to the power of four

the outer function is logarithm with base four so we had to write its derivative, which is one over its argument multiplied by the natural logarithm of four

the inner function is x to the power of four, so we calculate its derivative, which is four times x cubic

Finally we obtain a simplified result

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