Exercise 1

Explain why the natural logarithmic function $y = \ln x$ is used much more frequently in calculus than the other logarithmic functions $y = \log_b x$.

Solution

The derivative of $y = \ln x$ is $y' = 1/x$, whereas the derivative of $y = \log_b x$ is

$$y' = \frac{1}{x \ln a}.$$

The natural logarithmic function is used more often in order to simplify formulas.