

## 1 Math principle

$$\begin{aligned}\int_1^n \frac{1}{x} dx &= [\ln |x|]_1^n \\ &= \ln n - \ln 1 = \ln n\end{aligned}\tag{1}$$

## 2 Experiment data

slider $n$	myarea	mylog
3	1.0986	1.0986
6	1.7918	1.7918
9	2.1972	2.1972

Table 1: Data from GeoGebra

## 3 Observation

The animation and Equation (1) demonstrate that the area bounded by the function  $f(x) = \frac{1}{x}$  on a specific interval  $[1, n]$  can be used for computing the value of  $\ln n$ . In addition, as  $n \rightarrow \infty$ , the area is not finite because  $\ln n \rightarrow \infty$ .