

# Euler-Mascheroni constant

Paolo Bettelini

## Contents

# 1 Definition

Both the *harmonic series*  $H_n$  and *natural logarithm*  $\ln(n)$  diverge as  $n \rightarrow \infty$ . However, they are both slowly diverging functions and  $\gamma$  is the difference between them as  $n \rightarrow \infty$ .

$$\gamma = \lim_{n \rightarrow \infty} H_n - \ln(n) = \sum_{k=1}^{\infty} \left( \frac{1}{k} - \ln\left(\frac{k+1}{k}\right) \right)$$