

Quiz

Read the R handout from the class webcourse and answer the following questions.

Problem 1

1. Write an “R” function to compute the n th partial sum:

$$H_n = \sum_{k=1}^n \frac{1}{k}.$$

H_n is called the n th harmonic number.

2. Check that when $n \rightarrow \infty$, H_n does not converge. This is the “Harmonic series.”

Problem 2

1. Write an “R” function to compute the sum

$$S_n = \sum_{i=1}^n \frac{1}{i^2}$$

2. Check that when $n \rightarrow \infty$, S_n does indeed converge. It was shown by Leonhard Euler that the exact sum of this series is $\pi^2/6$. This problem is known as the Basel problem.