

Exercises: Sequences and Series Lecture 2 (8.1)

Find whether the following series converge or diverge:

$$\begin{aligned} \sum_{n=1}^{\infty} \frac{n^3+1}{n^4-2} \\ \sum_{n=1}^{\infty} \frac{n^4-2}{n^3+1} \\ \sum_{n=1}^{\infty} \frac{n^2}{e^n} \\ \sum_{n=1}^{\infty} \frac{1}{n^2+\cos^2(n)} \end{aligned}$$

Estimate how large N must be so that

$$\sum_{n=1}^N \frac{1}{e^n}$$

is within 10^{-4} of the series

$$\sum_{n=1}^{\infty} \frac{1}{e^n} = \frac{1}{1-e^{-1}} = \frac{e}{e-1}$$

Estimate how large N must be so that

$$\sum_{n=1}^N \frac{1}{n^4+n^2}$$

is within 10^{-4} of the series

$$\sum_{n=1}^{\infty} \frac{1}{n^4+n^2}$$