

Exercises: Alternating Series (8.4)

Decide whether the following series converge or diverge:

$$\begin{aligned} & \sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^3+1}{n^4-2} \\ & \sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^4-2}{n^3+1} \\ & \sum_{n=10}^{\infty} (-1)^{n+1} \frac{1}{\ln(\ln(n))} \\ & \sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n+\cos^2(n)} \end{aligned}$$

Estimate how large N must be so that

$$\sum_{n=1}^N (-1)^n \frac{1}{n(n+1)}$$

is within 10^{-4} of the series

$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n(n+1)}$$

Estimate how large N must be so that

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

is within 10^{-4} of the series

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