Absolute en voorwaardelike konvergensie / Absolute and conditional convergence §11.6

Definition

The series $\sum_{n=1}^{\infty} a_n$ is called *absolutely convergent* if the series $\sum_{n=1}^{\infty} |a_n|$ is convergent.

Definition

The series $\sum_{n=1}^{\infty} a_n$ is called *voorwaardelik konvergent / conditionally convergent* if it is convergent, but not absolutely convergent.

Theorem

If a series is absolutely convergent, then it is convergent.

Verhoudingstoets / Ratio Test

- If $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = L < 1$, then $\sum_{n=1}^{\infty} a_n$ is absolutely convergent (and hence convergent).

- If $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = L > 1$ or $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = \infty$, then $\sum_{n=1}^{\infty} a_n$ is divergent.

Homework

Ex. 11.6 nr. 1, 9, 13, 15, 19, 21, 39, 43

Worteltoets / Root Test

- If $\lim_{n\to\infty} \sqrt[n]{|a_n|} = L < 1$, then $\sum_{n=1}^{\infty} a_n$ is absolutely convergent (and hence convergent).

- If $\lim_{n\to\infty} \sqrt[n]{|a_n|} = L > 1$ or $\lim_{n\to\infty} \sqrt[n]{|a_n|} = \infty$, then $\sum_{n=1}^{\infty} a_n$ is divergent.

Homework

Ex. 11.6 nr. 25, 27, 29, 31, 35, 37

Read §11.7

Ex. 11.7