W09 Stepwise

Due date: Thursday 3/12, 11:59pm

01

Integral Test (IT)

Use the Integral Test to determine whether the series converges:

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

Show your work. You must check that the test is applicable.

02

Direct Comparison Test (DCT)

Determine whether the series is convergent by using the Direct Comparison Test.

Show your work. You must check that the test is applicable.

(a) $\sum_{n=1}^{\infty} \frac{1}{n^{1/3} + 2^n}$ (b) $\sum_{k=2}^{\infty} \frac{\sqrt{k}}{k-1}$

03

Limit Comparison Test (LCT)

Use the Limit Comparison Test to determine whether the series converges:

$$\sum_{n=1}^{\infty} \frac{1}{\sqrt{n} + \ln n}$$

Show your work. You must check that the test is applicable.

04

Absolute and conditional convergence

Determine whether the series are absolutely convergent, conditionally convergent, or divergent.

Show your work. You must check applicability of tests.

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n^{1/3}}$ (b) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n^4}{n^3+1}$

05

Alternating series: error estimation

Find the approximate value of $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n!}$ such that the error E_n satisfies $|E_n| < 0.005$.

How many terms are needed?