MATH 5B - Single Variable Calculus II — Spring 2019

§11.3 The Integral Test and Estimating Sums

In-class Activity 11.3

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Activity 1:

Use the integral test to determine whether $\sum_{n=1}^{\infty} \frac{1}{1+n^2}$ converges or diverges.

Activity 2:

Use the integral test to determine whether $\sum_{n=1}^{\infty} \frac{\ln(n)}{n}$ converges or diverges.

Activity 3:

Use the integral test to determine whether $\sum_{n=1}^{\infty} ne^{-n}$ converges or diverges.

Activity 4:

Use the integral test to determine whether the series converges or diverges.

(a) $\sum_{n=1}^{\infty} \frac{1}{n^5}$

(b) $\sum_{n=1}^{\infty} \frac{1}{n^{1/4}}$

Activity 5:

(a) Approximate $\sum_{n=1}^{\infty} \frac{1}{n^4}$ by finding the sum of the first 10 terms (use Sage). Estimate the error involved in this.

(b) How many terms are needed to ensure the partial sum is accurate to within 0.000005.

Activity 6:

Give an upper and lower bound for Euler's series $\sum_{n=1}^{\infty} \frac{1}{n^2}$ with $n = 100$.