

21C Homework 9

Due Friday June 3

Steinillos \equiv “Calculus and Analytic Geometry”, 5th Edition,
S.K. Stein and A. Barcellos

Question 1 Numerically verify $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^2} = .82\dots$ by summing sufficiently many terms. Compute remainders and, in turn, the theoretical error in your computation. This series is absolutely convergent and indeed $\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$. Compute the same number of terms for this series as were required in the alternating example and use the integral test to compute your theoretical error. Comment on the relative accuracy and efficiency of the alternating and positive series approximations.

Question 2 Steinillos, §10.6, pp 605-606, qq 2, 4, 8, 12, 13, 14, 16, 20, 26

Question 3 Steinillos, §10.7, pp 615-616, qq 2, 8, 10 (also give an exact answer for the limit), 12, 14, 26, 32

Question 4 Steinillos, §10.S, p 620, q 40. (The simple pole of the Riemann zeta function.)

Question 5 Steinillos, §11.1, pp 628-629, qq 2, 14, 16, 18, 24, 30, 34