

Show all work on this sheet, including indications of mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation/syntax. Label parts, box final short answers.

① $S = \sum_{n=1}^{\infty} \frac{1}{n^{11}}$ (eleventh power)

- Justify the convergence of this infinite series.
- Write out the 5th partial sum exactly and give its decimal equivalent.
- Estimate the truncation error R_5 using the integral remainder approach.
- How many terms do you need to get 10 decimal place accuracy? Show all work.
- On the basis of d), evaluate S to 10 decimal place accuracy.