MAT 127: Calculus C

Mini-Quiz:
approximating sums of infinite series

DO NOT TURN THIS PAGE OVER YET

This mini-quiz is **for practice only**. It will not be graded or even collected.

On the next page, you will find a problem containing two convergent infinite series. You will need to explain why each of them converges and to estimate the sum of each of them with specified precision.

You have **20 minutes** to complete the entire problem.

Taking about 10 minutes on the analogous one-series problem on the final should be ok (this would be one point per minute, which is what you need to average). Thus, you are being asked to complete the mini-quiz at about the same pace as needed for the final exam.

Explain why each of the following series converges. Then estimate its sum to within 2^{-10} using the minimal possible number of terms, justifying your estimate; leave your answer as a simple fraction p/q for some integers p and q with no common factor. Is your estimate an under- or over-estimate for the sum? Explain why.

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

(b) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n^5}$