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Homework #5

1) Integrating a Function

Using the recursive trapezoidal rule to within a tolerance of $\epsilon = 10^{-4}$, the integral of the function is approximated as 147.413177. To obtain this integral threshold, I had to use a value of $n = 13$, which consequently meant my stepsize was $h = \frac{5}{2^{13}} \approx 0.000610$.

2) Simpson's Method

Using Simpson's method, and using the same stepsize value for h as above, the calculated integral I obtained was 147.413159. This estimate is actually reasonably close to the real answer

$$e^5 - 1 \approx 147.413159102577.$$

3) More Integration

To evaluate this integral so that the fifth decimal point is unchanging, I again used the same stepsize as above with the Simpson's method. The calculated integral using this method is 3.141592.