Math 21B, Fall 2023.

Discussion Problems 2 (Thu., Oct. 5)

1. Partition the inteval $[0, e]$ into 5 subintervals of equal length and let c_i be the *left* endpoints of the subintervals. Form the approximating sum (i.e., the Riemann sum) for $\int_0^e \log(x+1)\,dx$. Does the sum underestimate or overestimate the integral?

2. Use Simpson's rule with $n = 6$ to approximate $\int_0^\pi \sin x\,dx$. Simplify your answer to the point where a calculator would be useful. Then do the same with the trapezoidal method. Does the trapezoidal method underestimate or overestimate the integral?

3. Find a definite integral that is approximated by

$$\sum_{i=1}^{100} \frac{1}{200+i}.$$

Is the sum larger or smaller than the integral?