Math 136: Calculus 2
Spring 2017
Professor Levandosky
Written Homework 7

1. Consider the definite integral $\displaystyle\int_1^4 \frac{e^x}{x}\,dx$.

   (a) Compute T_6 and S_6. (Write out the sums by hand and use a calculator, not Wolfram Alpha.)

   (b) Find bounds on the errors for each approximation in part (a).

   (c) How large must N be in order for T_N to approximate the integral to within 10^{-8}?

   (d) How large must N be in order for S_N to approximate the integral to within 10^{-8}?

   (e) Use Wolfram Alpha to calculate S_N for the value of N found in part (d).

2. Find the arclength of the curve $y = \frac{1}{6}x^3 + \frac{1}{2}x^{-1}$ over the interval $[1, 2]$.

3. Find the area of the surface obtained by rotating the portion of the curve $y = x^3$ over $[0, 2]$ about the x-axis.