

# SDSU COMP521

## Fall 2023

Homework 04 - Due Date: Friday 10/13/2023

October 2, 2023

### Problem

Approximate the integral of  $f(x) = e^{-2x} \sin(2\pi x)$  on the interval  $x \in [0, 3.5]$  using:

1. The composite trapezoidal rule
2. The composite Simpson's rule
3. Adaptive quadrature

**You have to use the Matlab code provided with this document.**

**For the composite rules**, use the following number of integration subintervals  $N = \{20, 40, 80, 160\}$ . Use these solutions to determine the orders of accuracy. The exact integral is 0.1446445197. Use this value to calculate the absolute errors.

Compare the results from the quadratures. Use a table to show the results.

**Discuss your results.**

**Deliverable:** Submit a .PDF file with your report. Submit the **main.m** code file only with your modifications.