

MATLAB: Assignment 3

Instructions

- Work in small groups of 2-3 students, all contributing to both coding and writing.
- Explain steps by commenting on them.
- Once you have completed the problem, generate a pdf file with the results using the **Publish** option in matlab. **Please give me a hard copy of the pdf file.**
- **Failure to follow these instructions will result in loss points (up to the full amount of the homework total).**

Due on Friday, April 5th in class

Problem 1

In this exercise, you will code Composite Simpson's method in MATLAB.

Write a MATLAB script that uses the composite Simpson's method to approximate $\int_0^4 x^3 dx$ with $n = 100$ subintervals.

Problem 2

In this exercise, you will write a MATLAB script to approximate an initial value problem using the Euler's method.

Use Euler's method with $n = 10, 20$, and 160 to approximate the solution of the following IVP:

$$\frac{dy}{dt} = t^2 - y, \quad y(0) = 1, \quad 0 \leq t \leq 2.$$

Plot the points (t_i, y_i) obtained by the Euler's method for each n value. Also in the same figure, plot the actual solution (to solve the IVP analytically, please refer your MAT 239 notes). Explain steps by commenting on them.