ECE 3340 Numerical Methods

Homework 11: Differential Equations

Name: **ID:**

Problem 1: Euler's Method

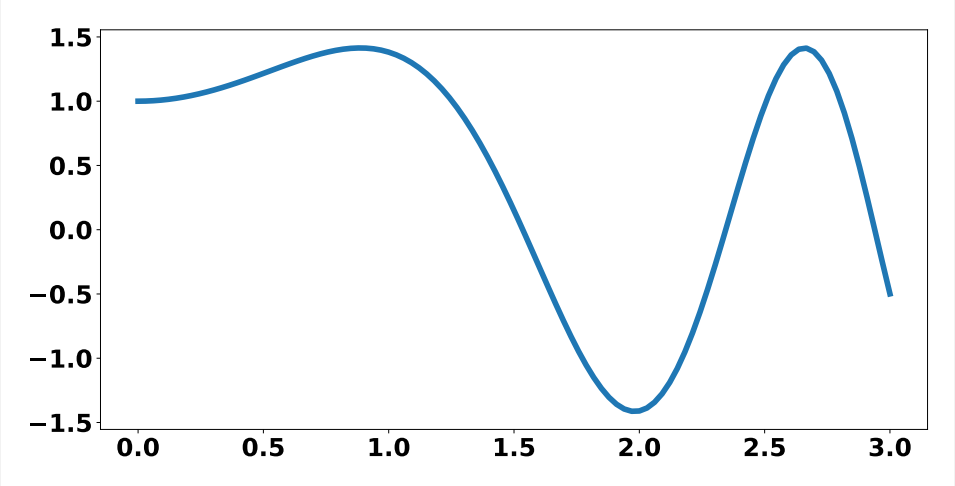
Approximate the solution to the differential equation using 6 iterations of Euler's method with a spacing of $\Delta_x = 0.5$:

$$y' = 2x\left(\cos x^2 - \sin x^2\right) \quad \text{where} \quad y(0) = 1$$

Calculate the relative error at each step based on the analytical solution

$$y(x) = \cos x^2 + \sin x^2$$

and plot the approximated solution.



	x_n	y_n	dy/dx	y_{n+1}	$y(x_{n+1})$	E_r
1						
2						
3						
4						
5						
6						