

Assignment No. 2

Deadline: October 20; 2022

Total Marks: 100

Task:

Part (1): Write Mathematica code for *Bisection*, *Regular False* and *Newton Raphson Methods* (write your own code as detailed in the classroom) and solve the following test problems with mentioned methods.

Part (2): Also, compute solutions for the following problems through built-in routines available in Mathematica and compare your results.

Part (3): Plot the given functions and visualize roots.

$$e^x - x^2 + 3x - 2 = 0 \quad \text{for } 0 \leq x \leq 1$$

$$2x \cos(2x) - (x + 1)^2 = 0 \quad \text{for } -3 \leq x \leq -2 \quad \text{and} \quad -1 \leq x \leq 0$$

$$x \cos x - 2x^2 + 3x - 1 = 0 \quad \text{for } 0.2 \leq x \leq 0.3 \quad \text{and} \quad 1.2 \leq x \leq 1.3$$

Note: (i) Apply mentioned methods to determine the roots with an accuracy of 10^{-5} in each problem. Also,

(ii) After completion of assignment upload your Mathematica Notebook in google class room. No hard copy is required for this assignment.

(iii) All the details should be write in comment form in Mathematica note book to describe your code steps.