

Assignment 1

Numerical Analysis by Maqsood Alam

Due date: 13/11/2020

Q1) find the root of $e^x + \sin x = 4$ in the interval $[1, 2]$ using the method given below.

(tolerance = 10^{-4})

- a. Bisection method
- b. Newton's method
- c. Secant method
- d. False position method

Q2) Consider the following methods for calculating $2^{\frac{1}{4}}$, the fourth root of 2.

Rank them for speed of convergence, from fastest to slowest.

- a. Secant method applied to $f(x) = x^4 - 2$
- b. Fixed point iteration applied to $g(x) = \frac{x}{2} + \frac{1}{x^3}$
- c. Fixed point iteration applied to $g(x) = \frac{x}{3} + \frac{1}{3x^3}$

Computer Problems:

Q3) Implement the following methods in python

- a. False position method
- b. Fixed point method

Q4) find the root of $e^x + \sin x = 4$ in the interval $[1, 2]$ on python using the following methods using tolerance = 10^{-4} and tolerance = 10^{-6}

- a. Bisection method
- b. Newton's method
- c. Secant method
- d. False position method