Supplementary Assignment #3

Numerical Analysis

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*Due Date: Apr. 5 (Sun), 2020

Reference: Week3 lecture note

1. Error Analysis for Iterative Methods

   (a) (2 points) Let $f(x) = e^x - x - 1$. Show that f has a zero of multiplicity 2 at $x = 0$.

   (b) (3 points) Apply Newton's method to f defined in (a) with $p_0 = 1$ and calculate p_n until $n = 16$. What can you conclude about the rate of convergence? (It's enough to replicate Table E1 and discuss about the rate of convergence.)

   (c) (3 points) Apply Modified Newton's method to f defined in (a) with $p_0 = 1$ and calculate p_n until $n = 5$. What can you conclude about the rate of convergence? (It's enough to replicate Table E2 and discuss about the rate of convergence.)

2. Müller's method

   (a) (2 points) Explain the difference between the Secant method and Müller's method.