

MATH 170B HOMEWORK 1

SOLUTIONS OF A SINGLE NON-LINEAR ALGEBRAIC EQUATION

Bisection Method.

§1: If the bisection method is used starting with the interval $[2, 3]$, how many steps must be taken to compute a root with absolute accuracy $< 10^{-6}$? Answer the same question for the *relative* accuracy.

Newton's Method.

§2: Perform two iterations of Newton's method on this system,

$$\begin{aligned}4x_1^2 - x_2^2 &= 0 \\4x_1x_2^2 - x_1 &= 1\end{aligned}$$

starting with $(0, 1)$.

§3 : [1] First part of question of 1.3

§4 : [1] 1.6

§5 : [1] 1.7

Secant Method.

§6: [1] 1.10

Fixed Point Method.

§7: [1] First part of question of 1.2

REFERENCES

- [1] Süli, Endre, and David F. Mayers. An introduction to numerical analysis. Cambridge university press, 2003.