

Homework Assignment 3

Due on Friday 10/18

Programming Problems:

1. List and compare the first 5 iteration approximations obtained by Newton's method, the bisection method and the method of false position for the equations

$$(i) \quad \tan(\pi x) - x - 6 = 0$$

and

$$(ii) \quad x^4 - x^3 - 3x^2 + 5x - 2.$$

For (i), use the initial conditions and exact root values given in the Table 2.5 on page 97 of the text book for three methods. List the absolute error e_n for all three methods.

For (ii) use $a = 0$, $b = 1.5$ for the bisection method and the false position method, and $p_0 = 0$ for Newton's method.

Which method is better for (i) and (ii)? Find the modified Newton's method to recover quadratic convergence rate for (ii).

Writing Problems:

Do the following exercise problems in the text book by Bradie,

Sec 2.4: 6, 7, 12, 14(b), 16

Sec 2.5: 1(d), 3, 4, 7, 11(c), 16(a)