

MATH 413
Fall 2007
Lab4

Exercise Set 2.4

Exercise 1

(3 pt)

Given the function $f(x) = x^4 + x^3 - 19x^2 + 11x + 30$.

Plot the function using maple.

Find the root of this function in the interval $[0, 2.5]$ within 10^{-3} using 413 Tutorial and the Newton's method with starting value $x = 1$.

Calculate the ratio $\frac{|\alpha - x_{n+1}|}{|\alpha - x_n|}$ for all n where α denotes the exact root of the function.

Compare the computed ratio to the theoretical one. Do they match?

Exercise 2

(4 pt)

Like Exercise 1, only with the function $f(x) = x^5 - x^4 - 21x^3 + 49x^2 + 8x - 60$.

Exercise 3

(3 pt)

Like Exercise 1, only with the function $f(x) = x^6 - 3x^5 - 19x^4 + 91x^3 - 90x^2 - 76x + 120$ and accuracy 10^{-2} .