



MATH205 NUMERICAL ANALYSIS, TUTORIAL WEEK 2

In this tutorial, you are supposed to write and understand short MATLAB programs that implement different methods for finding function roots, and are described in the textbook, chapter 5, pp 139, 161. In addition, you will learn how to use the MATLAB function `fzero`.

1. Use the Newton's method to find the root of the following function:

$$f(x) = x^3 - 4x^2 - 2x + 5$$

The initial guess $x_0 = 0.5$ and tolerance is 0.001.

Number of iteration n	Guess x_n	Error
0		
1		
2		
3		
4		

Repeat this using MATLAB program on page 161! Use the `fzero` function to find the root.

2. Use the bisection and Regula Falsi methods to find one root of the following function

$$f(x) = x^3 - 2x^2 - 5$$

Use the interval $x_l = 2$ and $x_u = 3$ as the initial boundaries and **Tol** = **0.00001** = $1e-5$. How many iterations are needed for the first and how many of them for the second method? What is the increase in number of iterations if the tolerance is **Tol** = **0.0000001** = $1e-7$?