

MAT-202E NUMERICAL METHODS HOMEWORK 1

Due date for source code submission via e-mail: 12.10.2008 @ 12 pm
Due date for the submission of the report: 13.10.2008

The following third degree monic polynomial has three real roots.

$$f(x)=x^3-8x^2+12x-4$$

- a. Using MATLAB, FORTRAN or C/C++ find the roots of the above polynomial and plot it.
- b. Write a MATLAB, FORTRAN or C/C++ code to recover the zero of the polynomial within [0,1],
 - i. By using False Position Method
 - ii. By using Newton-Raphson Method
 - iii. Plot the percent true error versus iteration number and percent relative approximated error versus iteration number on the same figure.

Hint: Use two functions named Fun(variable.name) and Deriv(variable.name) which calculate the value of the function and its derivative respectively.

Results must be printed to an output file named as HW1-ID#-fp.txt for false position and HW1-ID#-nr.txt for Newton-Raphson Method. Output file ought to include; the iteration number, calculated root, percent relative error and percent true error for each iteration. Print the initial guess for the Newton-Raphson iteration procedure asd well.

Homework Rules

You should present your **own** work during the course. Any unethical behaviour shall be penalized seriously.

You will post your homework in a zip file named as 'HW1-ID#.zip' to the address tuncero@itu.edu.tr

The zip file should include the necessary source codes and executables (m-files, C or FORTRAN codes, etc.)

Homework Format

Homework should consist of the following parts. Problem Definition and Discussion and Conclusion parts should be typed up using a word processor software. Neatness counts.

1. Cover Page (The cover page should state the name and ID number of the student clearly, cover page also needs to include the course name and homework number)
In addition, cover page must also include the following statement at the bottom;
"I have neither given nor received any unauthorized help for this assignment"

Your Signature

2. Problem Definition
3. Results (In Numerical or Graphical Format)
4. Discussion
5. Appendix (Source Code, etc.)

Source code should include the necessary comments and results should be presented with at least 5 digits.