

MATH661 Homework 4 - Approximate solution of nonlinear systems

Posted: Oct 6, Due: 11:55PM, Oct 18

1 Problem statement

View all the following exercises as applications of approximation theory to the problem of solving a nonlinear equation $f(x) = 0$.

2 Theoretical exercises

1. K&C, 3.1.1, p. 79. First construct Rolle sequence and sketch a qualitative plot of the function $f(x)$ (use mouse and Insert->Image->Draw image). Next, find a positive root using a hand calculator or Octave/Python for arithmetic. Finally, use Gnuplot to get a better plot of the function f . Compare to previous qualitative plot obtained from Rolle sequence.
2. K&C, 3.2.4, p. 90
3. K&C, 3.2.13 and 3.2.15, p. 91
4. K&C, 3.2.18 and 3.2.19, p. 91-92
5. K&C, 3.4.12 and 3.4.13, p. 106
6. K&C, 3.6.1, p. 138

3 Implementation and analysis

1. K&C 3.1.1, p. 80.
2. K&C 3.1.4, p. 81.
3. K&C 3.5.2, p. 129.
4. K&C 3.5.3, p. 129.