
Math 4610 Fundamentals of Numerical Analysis Tasksheet 4

The problems for the Tasksheet 03 are included below. The deadline for turning in your work on these problems will be posted on the repository. In addition, you will turn in your work through the math4610 repository. A directory will be constructed that will be used as a place to store your work.

Tasks

Task 1: Create a code that will search for a root of a function, $f(x)$, using Newton's method. Use the problem defined in Tasksheet 4, Task 4 to test the code you write. Create a software manual entry and shared library addition for your Newton method routine. Include the example problem results in your software manual entry.

Task 2: Repeat Task 1 for the secant method. It should be easy to modify a Newton method code to implement the secant method.

Task 3: Do a computational convergence analysis on Newton's method to verify quadratic convergence. Use the example defined in Tasksheet 4 to illustrate the work.

Task 4: Repeat Task 3 for the secant method.

Task 5: Create a hybrid method that will search for roots by combining the Bisection method when the approximations are too far from a root and then switches over to Newton's method when the approximations are close enough.

Task 6: Search the internet for sites that detail differences between the Bisection method, Newton's method, and the Secant method. Write a brief summary of what you find including the pros and cons of the methods. Your write up should be a brief paragraph (3 or 4 sentences) that describe your findings. Include links to the sites you cite.

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