

Computational Homework 1, due February 4th

Do the following tasks:

1. Download *simpleNewton.m*. Save it in your local directory.
2. Modify *simpleNewton.m* so that Newton's method can be carried out to approximate the root p of $f(x)$ given an initial guess p_0 .

Test the routine on

- a. $f(x) = x^2 - 13$ with $p_0 = -1, 2$, where $p = \sqrt{13}$
- b. $f(x) = \frac{1}{2}x^2 + x + 1 - e^x$ with $p_0 = 1$, where $p = 0$

For both functions, calculate the absolute error $|p_k - p_{k-1}|$ and the residual $|f(p_k)|$. Are the sequences converging quadratically to p ? Explain why or why not.

You should turn in the following:

- all the modified codes
- list of relative errors and residuals
- actual error
- explanation of convergence rate for both functions