HOCHSCHULE
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Numerical Mathematics

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7) Gauß-Gauß-Seidel Grand Prix

Take a look at the MATLAB code "gauss_gauss_seidel.m" (see Moodle).

a) Explain what the code is doing.

b) Run the code and explain the graphs it produces.

c) Write pseudocode for the Gauß- Seidel algorithm.

8) Interpol most wanted

Revise your lecture notes on Newton interpolation.

a) Make sure you understand how the recursion formula for the n^{th} degree interpolation polynomial $p_n(x)$ works. Convince yourself that the tabular arrangement of divided differences actually helps you to perform the calculation

b) Find the polynomial $p_n(x)$ of least degree (which is it, i.e. what is n ?) that takes the values $p_n(-1) = -12, p_n(0) = -3, p_n(1) = 6, p_n(2) = 27$. Write the polynomial in the standard form $p_n(x) = c_0 + c_1 x + c_2 x^2 + ...$

c) Write pseudocode (or better: code) for a function performing Newton interpolation using the recursion formula.