

**Instructions for seminars from Numerical Analysis:
Least squares approximation**

Continue work with the Maple document `aproximE.mw`. You can choose the approximated function, approximating functions and their number, the number and distribution of nodes. You should be able to solve the simplest tasks without a program. Before trying to solve the second task for assessment, you should pay attention to the following topics:

A. Error of the method

Approximate function $f_1(t) = \ln t$ at interval $\langle 0, 1; 10 \rangle$ and observe the dependence of the error of the method

1. on the number of nodes (e.g., for the approximation by a polynomial of degree at most 5);
2. on the degree of the approximating polynomial for a fixed number of nodes, e.g., 20;
3. on the approximating functions used, e.g., $\varphi_1(t) = 1/(t+r)^s$, $\varphi_2(t) = \exp(-t/T)$, etc.; observe also the values of the coefficients of the components of the solution.

B. Round-off errors

Repeat the approximation from A2 for function $f_2(t) = \ln(t-p)$ at interval $\langle p+0, 1; p+10 \rangle$, where p is a big constant, e.g., 10^4 . (The error of the method remains the same.)