ABSTRACT

for coursework, student Zhyvotovsky Ruslanm, group XA-51
on discipline "Numerical methods"
on the topic of "Solution of a system of n-th order nonlinear algebraic equations by the Newton method"

In the course work the Newton's method for solving systems of nonlinear algebraic equations has been thoroughly reviewed and investigated.

An algorithm for solving systems of nonlinear algebraic equations has been developed, implementing language C ++ CLR in Visual Studio environment. The developed software has a user-friendly interface, optimized memory required to store data, and it provides a record in the file of received results.

The study was carried out on the example of solving systems of different order on three different platforms (MS Excel, Mathcad and software product developed in C ++ CLR).

Also the function approximation was reviewed in the the task, factors of empirical dependence for a given table function corresponding to the Arrhenius law have been found. The appearance of determination and approximation coefficients depending on the comparative analysis of the results has been maintained. In the process of the assignment approximation function as a polynomial approximation has been received and the results has been evaluated. Spline interpolation is carried out on the example of a cubic spline for a given function of tabular test results with built-in capabilities of the approximation of functions in the environment of MS Excel, and all the results are achieved with high accuracy.