

ABSTRACT

for course work, student Svitlychna Anastasia, group XA-51
on discipline "Numerical methods"
on the topic of «*Solving boundary value problems for ordinary differential
equations with tridiagonal matrix algorithm*»

In the course work the boundary value problem for ordinary differential equations of the 2nd order is reviewed and studied in details. The study was carried out to examine the method of running, the algorithm of calculation and the software product was created in the Visual Studio 2015 programming environment (C ++, Win32 Console Application Programming). The program has a service in the form of a standard menu, which provides data entry, outputting results, giving instructions to the user. In the case where the resulting solution is inadequate, it is possible to recalculate with a smaller step. Examination of test cases was carried out using two software products – MS Excel, MathCad.

Also, the problems of approximation of functions for experimental data were reviewed in the paper. The first task was to find the coefficients of empirical dependence. For a given table function, we find an approximative that corresponds to the Arrhenius law. The second task was based on the finding of the general form and the coefficients of approximating dependence. Namely, the form of the approximating function was determined, received in the form of a polynomial and evaluated the result of approximation. The comparative analysis of the approximation functions obtained was developed. The third task was to construct an approximating function in the form of a cubic spline for a table-defined function and to verify its operation.