A METHOD FOR SOLVING A SIMPLE LINEAR PROGRAMMING PROBLEM

Pignasty O.M., Ustimenko K.A.
National Technical University «Kharkiv Polytechnic Institute», Kharkiv

In [1] are consideredmethods for solving isoparametrical problems of the calculus of variations, in which linearity of functionalsdoesn't allow to use classical mathematical apparatus. Given circumstance leads to need to develop special methods for solving these problems [1]: a) the solution in a given class of integrable functions [1,2]; b) the discretization of the problem of continual linear programming (CLP) and reduction to ordinary linear programming problem; c) the solution in the class of delta functions by methods of nonlinear mathematical programming.

The simplest of the described problems can be solved by conventional means, if the class of functions in which the decision is constructed, is set [1, p.25]. However, often the chosen class of functions does not allow receiving the convergence of the solution, because the solution is not possible to present in this class with a given accuracy. In work was considered the method of solving the problem with application of Legendre polynomials:

$$M = \int_{-1}^{1} c(t)x(t)dt \to \max, c(t) = 1 - t^2, \int_{-1}^{1} a(t)x(t)dt = 1, \quad a(t) = 1, x(t) \geq 0, t \in [-1,1].$$

The results are presented in the diagram below.It is shown that the accuracy of the calculation functional M is related with the amount terms of the expansion $c(t)$ in series of Legendre polynomials.For function $x(t)$ was obtained an exact solution.

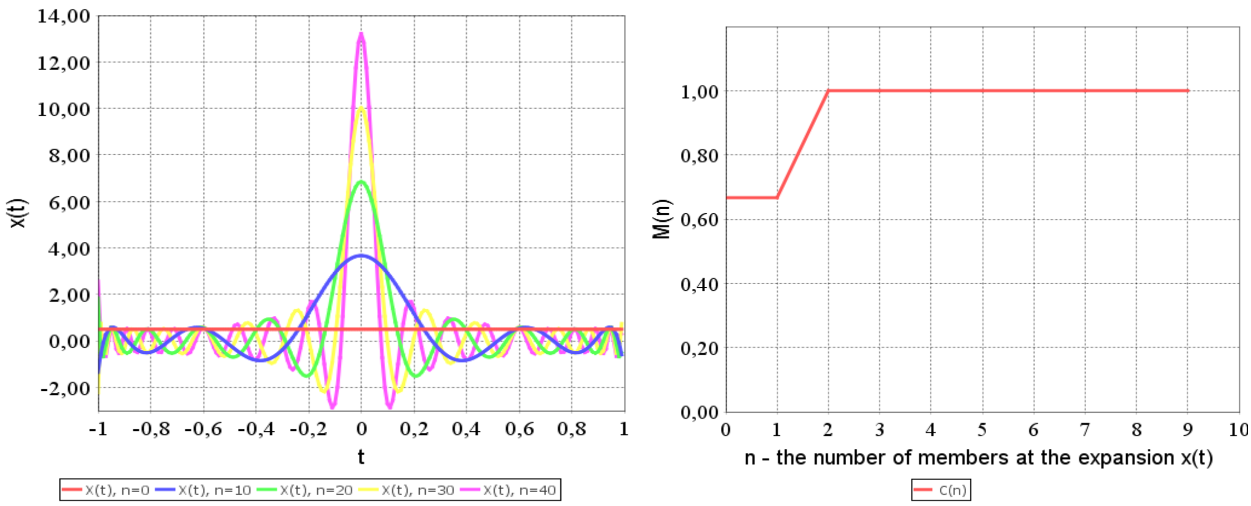

Fig. –Convergence of $M(n)$ as a function of the number of members n expansion of the solution $x(t)$ in Legendre polynomials

Literature:

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