

THE THEORY OF NON-CLASSICAL PROBLEMS OF THE  
BEST APPROXIMATION

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The problems of the best approximation of functions and solutions of differential equations by functions, quasipolynomials, a series and solutions of differential equations are called non-classical.

They are characterised by the following: the class of possible solutions belong to countable-dimensional space of functions  $W_p^z(\Omega)$ ,  $p \geq 1$ ,  $\Omega$  - bounded area of space  $E^n$ . Extreme criterium has a vector finite-dimensional character.

In these problems countable-dimensional systems of finite and differential (ordinary and partial derivatives) constraints of the general type of equalities and inequalities are present.

The functions expressing extreme criterium and constraints may be, over unknown functions and their derivatives, only quasidifferentiated in the sense of conceptions of local-convex analysis.

The direction of the construction of the theory of the problems mentioned above is given in the report. This direction provides extending Euler-Lagrange conditions in necessary and sufficient forms.

The results of the work allow to widex the class of investigated problems and their solutions, to simlity the form and the procedure of constructing extreme conditions, to create the more complete modern and general theory of the best approximation and variational calculus.