investment structure change moments. Finally, one example is presented for illustration.

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IMPLICIT FUNCTION THEOREM AS A REALIZATION OF LAGRANGE PRINCIPLE FOR EXTREMAL PROBLEMS. ABNORMAL POINTS

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In the first part of this report we study optimization problems with a scalar and vector objective function and with equality and inequality-type constraints. The first and the second-order necessary conditions for this problem are obtained. The difference between these conditions and known ones is that the obtained conditions are informative even in the abnormal case. We have introduced the class of 2-normal constraints. It is shown that for 2-normal constraints the gap between the obtained necessary conditions and sufficient conditions is minimal possible. It is proved that the generic map is 2-normal.

In the second part of the report smooth nonlinear mappings in a neighborhood of an abnormal point are considered. Inverse and implicit function theorems for this case are obtained. The proof is based on the examination of a family of constrained extremal problems; in this process the described above the first and the second order necessary conditions that are substantive in abnormal case are used. If the point been considered is normal then these conditions turn into classical ones.

INVESTIGATION OF THE SOLUTION OF A BOUNDARY VALUE PROBLEM CONTAINING A COMPLEX PARAMETER POWER ON THE BOUNDARY CONDITIONS

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We consider a problem on binding the solution of the equation:

$$\sum_{k=0}^{3} a_k \lambda^{2k} y^{(6-2k)}(x,\lambda) = f(x,\lambda), \qquad (1)$$

satisfying the boundary conditions:

$$l_\upsilon(y) = \sum_{k=0}^{5} \alpha_\upsilon(\lambda) y^{(k)}(0,\lambda) + \beta_{\upsilon\, k}(\lambda) y^{(k)}(1,\lambda) = \varphi_\upsilon(\lambda), \qquad (\upsilon = \overline{1,6}), \quad (2)$$

where the coefficients $a_k \ (k = \overline{0,3})$ of the equation are constant numbers, and $\alpha_{\upsilon\, k}(\lambda);\ \beta_{\upsilon\, k}(\lambda) \ (\upsilon = \overline{1,6};\ k = 0,5)$ are polynomials of a complex parameter λ. Further-more, real parts of the roots of the characteristic equation $a_3\upsilon^3 - a_2\upsilon^2 + a_1\beta\upsilon - a_0 = 0$ are negative or equal zero. We right hand sides of the equation and boundary conditions $f(x,\lambda),\ \varphi_k(\lambda) \ (k = \overline{1,6})$ are analytic functions with respect to λ in the domain

$$R_\delta = \{\lambda : \ |\lambda| > R\,, \ \left|\arg\lambda \le \frac{\pi}{4} + \delta\right|\}, E \in (0\,;\,1).$$

The problem (1),(2) is solved by the potentials theory method. The solution is sought in the form of a sum of special potentials by means of which the problem (1),(2)is reduced to the solution of the system of algebraic equations, with respect to unknown densities of these potentials, i.e.

$$y(x,\lambda) = \sum_{k=1}^{6} W_k(x,\lambda)\mu_k(\lambda), \qquad (3)$$