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SOV 124 58 10 [illegible]

The Minimum Weight of Anisotropic Shells

non negative scalar factor. On the assumption that a shell of minimum weight enters the state of creep instantly and in its entirety, the author deems λ to be constant, from which (1) leads to the condition

$$D/\Delta = \text{const} \qquad (2)$$

of the constancy of the rate of dissipation per unit volume of the bearing volume. It is observed that this condition was derived from other considerations for the problem of the axisymmetric flexure of a circular isotropic plate by Freiberger and Tekinalp (Freiberger, W., and Tekinalp, B., J. Mech. and Phys. Solids, 1956, Vol 4, Nr 4, pp 294-299; RZhMekh, 1958, Nr 7, abstract 7992). A system of equations for the solution of shells and plates is written out. Ideas are suggested on the possibility of application of conditions of type (2) to the case of a shell consisting of a single layer. In conclusion, the "problem of optimum nonuniformity of the material" is posed, i.e., that of how the law of change in the creep limits of the material must be given relative to the coordinates so that all points of a solid will go instantaneously into the state of creep. By way of example, problems are solved for the optimum nonuniformity of a cylindrical tube and a spherical vessel subject to uniform internal pressure. Three unknowns, the radial and tangential stresses and the yield point, are found from

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SOV/124-58-10-11504

The Minimum Weight of Anisotropic Shells

three equations (the equilibrium equation, the condition of strain compatibility and the yield condition). It should be noted that the problem is meaningless in the rigid plastic formulation, while in the elastic plastic formulation the problem of optimum nonuniformity of material is trivial. Its solution is obtained immediately after the yield equation for the stress components found for the elastic problem is written. In particular, the examples examined by the author can provide nothing beyond the familiar Lamé equations. The author's equations for radial stresses coincide in point of fact agree with those of Lamé. The equations for the yield point are also correct. However, the equations for tangential stresses are erroneous in both of the examples stated.

G S Shapiro

Card 3/3

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M. Sh.

AUTHOR SOKOLOWSKIY, V.V., MIKYELADZE, M.Sh., PA - 2622

TITLE IX. International Congress on Applied Mechanics.
(IX myezhdunarodnom Kongryesye po prikladnoy mekhanike - Russian)

PERIODICAL Vestnik Akademii Nauk SSSR, 1957, Vol 27, Nr 3, pp 101-103,(U.S.S.R.)
Received 5/1957 Reviewed 6/1957

ABSTRACT The International Society for studies in theoretical and applied physics organizes scientific congresses every 4 years. At present about 30 countries are members of the society, among them since a short time ago, also the Soviet Union. More than 500 scientists from 30 countries delivered lectures on the IX. International congress which took placefrom September 5. - 13. The following 4 lectires were delivered at the full session."Electrodynamics of high Velocities" by P. German (France), "New Horizons in Mechanics of hard Bodies"by P.Hill (England), "Sips" by M.Davidson (USA),and "The nonlinear phenomena of Vibration caused in Hard Bodies" by G. Mettles (German Federal Republic). Work was carried out mainly in two sections. "Mechanics of Liquids and Gases" and "Mechanics of Hard Bodies".Each of these sections was subdivided into subsections in which scientific lectures were delivered. The greatest attention was devoted to problems of hydromechanis and gas dynamoes dealt with by the first section. About 270 lectures weredelivered in the various other section, mainly on the theory of plasties. The following subjects were dealt with by scientists from the USSR. "The Gasdynamical Theory of Novae" (Sydov,L.I.), "The Theory of the Hardness of Plates and Layers"(Vasov,V.), "Problems ofGliging"

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IX. International Congress on Applied Mechanics. PA - 2622

(Rabotnov,Yu.N.), "Investigations of Tensile Strength in Plastics" (Sokolovskiy,V.V.), "Two Theories on Gas Flows"(Sryetyenskiy,L.I.), "Dynamics of inelastic threads of variable Length" (Savin,G.N.) "Integral Equations of the Thin Wing" (Madam Krasil'shchikova,E.A.) etc. In connection with an analysis of the work carried out this congress the opinion was expressed that there were too few plenary sessions.

ASSOCIATION
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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M.Sh.

Plastic shells of uniform strength. Soob. An Gruz. SSR 25 no. 4:391-398 O '60. (MIRA 14:1)

1. Akademiya nauk Gruzinskoy SSR, Tbilisskiy matematicheskiy institut im. A.M. Razmadze. Predstavleno akademikom N.I. Muskhelishvili.

(Elastic plates and shells)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

report presented at the 1st All Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

168. S. D. Leites (Dnepropetrovsk): On space buckling of columns in the elastic-plastic range.

169. V. S. Lenskii (Moscow): Fibre-creep at room temperature.

170. V. S. Lenskii (Moscow): Plasticity of metals under combined loading.

171. A. I. Leonov (Moscow): Some problems of non-stationary flow of an incompressible visco-elastic (Maxwellian) liquid.

172. A. I. Leonov, M. D. Businov (Moscow): Some problems of quasi-steady flow of an incompressible visco-elastic (Maxwellian) liquid.

173. M. Ia. Leonov (Lvov): The generalization of the torsion theory of thin-walled bars

174. M. Ia. Leonov, V. V. Panasyuk (Lvov): The development of microcracks.

175. Th. R. Lenik (Tartu): Plastic flow of circular plates under tension and bending of compression and bending.

176. S. G. Lekhnitskii (Leningrad): Torsion of an anisotropic curved bar.

177. A. D. Lizarev (Sverdlovsk): Free vibrations and stability of ordinary and prestressed elastic restrained beams.

178. A Lisowski (Krakow): Displacement of rocks due to excavation of sloping layers.

179. S. V. Litvinov (Kiev): On the application of matrix transformations to the solution of large sets of linear equations of elasticity theory.

180. O. I. Lotkin (Tomsk): The selection of [illegible]tional parameters for structures of equal stability consisting of plates and stringers.

181. P. A. Lukash (Moscow): Large deflections of shallow shells of non-linear elastic materials.

182. Ia. B. Lbin (Voronezh): Methods for the solution of the problems of axisymmetric states of stress in shells of revolution.

183. R. A. Malakhovskii (Gomel): Analysis of an orthotropic circular conical shell under an arbitrary load applied to a ring.

184. A. V. Malashenko (Kiev): On the experimental study of strains in plates and shells.

185. S. I. Malinin (Novosibirsk): Creep strains and ruptures of high polymers.

186. S. L. Malkina (Sverdlovsk): Vibrations of non circular cylindrical shells.

187. A. K. Malmeister (Riga): Some problems of combined loading of quasi-isotropic bodies.

188. K. A. Maltsev (Leningrad): The influence of structural discontinuity in concrete on its strength.

189. S. O. Mamedova (Baku): Investigation of the state of stress in a square prism with coaxial cylindrical hole under internal pressure.

190. G. F. Mandzhavidze (Tbilisi): Solving the plane elastic problem for anisotropic bodies by reduction to the problem of linear coupling with "displacements".

191. L. I. Manevich, Th. A. Shavlianov (Dnepropetrovsk): The stability of a cylindrical shell in bending.

192. V. M. Maranenko (Moscow): Stress and strain in naturally twisted bars.

193. V. I. Makhovikov (Taranobka): The problems of conformal transformation and plane elasticity for the exterior of an infinite number of holes.

194. Ia. A. Mazhorai (Moscow): The design of finite and infinite beams on elastic foundation including time effects and without adopting the hypothesis of Zimmerman and Winkler.

195. A. S. Melianovetskii (Staline): Vibrations of a curved bar in an elastic medium and on elastic supports.

196. S. B. Mesiaian (Erevan): An experimental study of basic creep laws for soils.

197. G. S. Migirenko (Novosibirsk): On statically equivalent loadings.

198. M. Sh. Mikeladze (Tbilisi): Contribution to the theory of plastic shells of uniform strength.

199. R. S. Minasian (Erevan): On the bending of a simply supported parallelogram plate.

200. S. V. Mikhailov (Moscow): Evaluation of the rheological properties of elastic, visco-plastic materials in homogeneous strain-rate under constant shearing stress.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M.Sh.

Equally stable layered structures. Soob. AN Gruz. SSR 26 no.4:397-404 Ap '61. (MIRA 14:8)

1. Tbilisskiy matematicheskiy institut imeni A.M. Razmadze AN Gruzinskoy SSR i Gruzinskiy politekhnicheskiy institut imeni V.I. Lenina. Predstavleno chlenom-korrespondentom AN GruzSSR O.D. Oniashvili.
(Elastic plates and shells)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M. SH.

Theory of perfectly plastic thin shells.
Asurvey of Soviet Contributions.

Report to be submitted for the Shell Structures, International Association for (IASS) Symposium on Non-Classical Shell Problems Warsaw, Poland, 2-5 Sept 63

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M.Sh., doktor tekhn. nauk, prof.; ONIASHVILI, O.D., red.; GIONGADZE, O.N., red.izd-va; BOKERIYA, E.N., tekhn.red.

[Statics of anisotropic plastic shells] Statika anizotropnykh plastichnykh obolochek. Tbilisi, Izd-vo AN Gruz.SSR, 1963. 117 p. (MIRA 16:8)
(Elastic plates and shells) (Plasticity)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M.Sh.

Semimomentless theory of cylindrical plastic shells. Dokl. AN SSSR 154 no.2:298-299 Ja'64. (MIRA 17:2)

1. Gruzinskiy politekhnicheskiy institut im. V.I. Lenina. Predstavleno akademikom A.Yu. Ishlinskim.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

L 31083-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(k)/EWA(h) Pf-4/Peb EM/RM

ACCESSION NR: AP5006990 S/0198/65/001/001/0062/0069

AUTHOR: Mikeladze, M. Sh. (Tiflis) 26 25 B

TITLE: Basic equations of semimembrane theory of orthotropic plastic cylindrical shells 26

SOURCE: Prikladnaya mekhanika, v. 1, no. 1, 1965, 62-69

TOPIC TAGS: plastic shell design, semimembrane shell theory, orthotropic plastic shell, cylindrical shell

ABSTRACT: The general semimembrane theory of plastic cylindrical shells is elucidated, assuming anisotropy of their material. The theory is based on the evident fact that a pure plastic state of a shell is possible if there is proper variation in the shell thickness; therefore, for a given loading of a cylindrical shell a thickness is sought for which the yield condition will be satisfied at every point of the shell. Such an approach to the problems provides for a certain optimality of their solutions. The formulas describing the plastic state of stress over the thickness of orthotropic cylindrical shells and the plasticity conditions are discussed. General solving equations for a

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ACCESSION NR: AP5006990

cylindrical shell are obtained from the equilibrium equation of a shell element, and the boundary conditions for various shell supports are established. Solving equations for particular cases (circular shell, shallow shell, arbitrary-cross-section shell) are derived. Basic equations of cylindrical uniform-strength shells are discussed, and the principles of designing the sandwich shells are outlined. Orig. art. has: 9 formulas. [VK]

ASSOCIATION: Gruzinskiy politekhnicheskiy institut (Georgian Polytechnic Institute)

SUBMITTED: 10Mar64 ENCL: 00 SUB CODE: AS

NO REF SOV: 008 OTHER: 004 ATD PRESS: 3198

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

L 33968-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(k)/EWA(h) Pf-4/Peb EM

ACCESSION NR: AP5007266 S/0198/65/001/002/0040/0047

AUTHOR: Mikeladze, M. Sh. (Tiflis)

TITLE: Evaluating the carrying capacity of shallow shells of rotation and of prolate-curved round plates

SOURCE: Prikladnaya mekhanika, v. 1, no. 2, 1965, 40-47

TOPIC TAGS: shell theory, shell structure, yield strength, centrifugal force, bending moment, stress load

ABSTRACT: The carrying capacity of shallow shells of rotation and prolate-curved slabs was investigated analytically. The governing equations are written in cylindrical coordinates, two for equilibrium conditions and one for the Mises' yield condition

$$\frac{d}{dr}(rT_r) - T_\theta = 0;$$

$$\frac{d}{dr}(rM_r) - M_\theta - (rT_r)\frac{d\xi(r)}{dr} = -\int_0^r prdr;$$

$$\frac{1}{h^2}(T_r^2 - T_rT_\theta + T_\theta^2) + \frac{12}{h^2}(M_r^2 - M_rM_\theta + M_\theta^2) = \sigma_s^2.$$

The condition for static stress

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is given by $T_r = T_\theta = N$ (constant). The condition for a kinematically possible solution is expressed by $\int_F pwdF = \int_F DdF$, where w is the deflection rate, F is the mean shell surface area, and D is the rate of dissipation of mechanical energy. A shell of constant thickness is considered with a mean surface $\xi(r) = f\left[1 - \left(\frac{r}{b}\right)^2\right]$ under a uniformly distributed load p. Using the above static-kinematic solution, the following lower and upper bounds for carrying capacities are derived: $p = \sqrt{p_m^2 + \left(\frac{4\sigma_s hf}{b^2}\right)^2}$; $p < p_m + \frac{8\sigma_s hf}{\sqrt{3}b^2}$. A similar analysis for the prolate-curved slab yields as an external boundary an ellipse with semi-axes 1 and 1.24. As a practical application the carrying capacity of a disk is considered subject to a tensile centrifugal force as well as an axial bending load. The internal and external bounds are then described by the curves $\bar{\omega}^4 + \bar{p}^4 = 1$ and $\bar{\omega}^4 + (1.01)^2\bar{p}^2 = (1.12)^4$ respectively. As a final application, the disk is assumed to be subject to a radial bending moment uniformly distributed along the outside periphery. Orig. art. has: 49 equations and 3 figures.

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L 33968-65
ACCESSION NR: AP5007266

ASSOCIATION: Gruzinskiy politekhnicheskiy institut (Georgian Polytechnical Institute)

SUBMITTED: 10Mar64 ENCL: 00 SUB CODE: AS,NP,ME

NO REF SOV: 003 OTHER: 000

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

L 43885-65 EWA(h)/EWP(k)/EWT(d)/EWT(m)/EWA(d)/EWP(w)/EWP(v) Pf-4/Peb EM

ACCESSION NR: AP5006850 S/0020/65/160/004/0789/0791

19
18
B

AUTHOR: Mikeladze, M. Sh.

TITLE: Theory of gently-sloping anisotropic plastic shells 24

SOURCE: AN SSSR: Doklady, v. 160, no. 4, 1965, 789-791

TOPIC TAGS: shell theory, anisotropic shell, plastic shell, gently sloping shell, equal strength shell, equal stress shell, orthotropic shell

ABSTRACT: The theory is developed with two aims in mind: determine the carrying capacity of gently sloping orthotropic shells, and find rational forms for their construction. The theory is based on the assumptions usually employed for elastic shells and on an approximate rigid-plastic computation scheme, in accordance with which both the elastic and the elastic-plastic parts of the shell are assumed to be rigid, meaning that the plastic state is assumed to be produced instantaneously through the thickness of the shell. The carrying capacity of the shell is determined with the aid of theorems formulated and proved by the author for orthotropic shells elsewhere (Statika anizotropnykh plastichnykh obolochek [Statics of Aniso-

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ACCESSION NR: AP5006850

tropic Plastic Shells], AN GruzSSR, 1963; Izv. AN SSSR, OTN, no. 1, 1957). The theory is applied to determine the carrying capacity of a gently-sloping shell hinged along a contour and subject to only a uniform vertical load. The question of equal-strength (and minimum weight) shell under the influence of specified forces is also considered. It is shown that for an isotropic shell with fixed hinged edges subject to only vertical load the equal-strength construction is also an equal-stress construction. This paper was presented by A. Yu. Ishlinskiy. Orig. art. has: 7 formulas.

ASSOCIATION: Gruzinskiy politekhnicheskiy institut im. V. I. Lenina (Georgian Polytechnic Institute)

SUBMITTED: 20Jul64 ENCL: 00 SUB CODE: AS

NR REF SOV: 006 OTHER: 006

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APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, M.Sh. (Tbilisi)

Basic equations of the semi-zero-torque theory of cylindrical orthotropic plastic shells. Prikl. mekh. 1 no.1:62-69 '65. (MIRA 18:5)

1. Gruzinskiy politekhnicheskiy institut.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

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1. [illegible] V. [illegible]

2. [illegible] (600)

4. Construction Industry - Finance

7. Ways in which to lower construction [illegible], [illegible], [illegible]. [illegible], 1[illegible].

9. Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

BRAZHNIK, Viktoriya Ivanovna; MIKELADZE, Pavel Vyacheslavovich; FOMICHEV, Vasiliy Ivanovich; USPENSKIY, V.V., kand. ekon. nauk, nauchnyy red.; MORSKOY, K.L., red.; MIKHEYEVA, A.A., tekhn. red.

[Planning and financing capital construction; practice of the Dnepropetrovsk Economic Council] Planirovanie i finansirovanie kapital'nogo stroitel'stva; opyt Dnepropetrovskogo sovnarkhoza. Moskva, Gosstroiizdat, 1963. 76 p. (MIRA 16:8)

(Dnepropetrovsk Province--Construction industry--Finance)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, R.M.

Studying the typology and dynamics of the alpine vegetation of Southern Ossetia. Soob.AN Gruz.SSR 23 no.4:457-464 O '59. (MIRA 13:5)

1. Akademiya Nauk Gruzinskoy SSR, Institut botaniki, Tbilisi. Predstavleno akademikom N.N.Ketskhoveli.
(Ossetia--Alpine flora)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

IKHALDZE, I. M. [illegible] -- " For the study of the Alpine covers of South Osetiya." Tbilisi, 1960 (Tbilisi State Univ im Stalin. Chair of Botany). (KL, 1-61, 188)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

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MIKELADZE, R.M.

Contribution to the study of the alpine carpets of southern Ossetia. Probl. bot. 5:170-181 '60. (MIRA 13:10)

1. Botanicheskiy institut AN GruzSSR, Tbilisi.
(Ossetia--Alpine flora)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE Sh. A.

1061 [illegible] 1925 VII, 204 გვ. 300 ც.

[illegible] 1925, 1.11

Мгалоблишвили Михаил Филиппович. К вопросу этиологии и лечения фибромиомы матки. Патолого-анатомическое и клиническое исследование. 1925. Изд. ТГУ. VII, 204 с. 300 экз.

Защ. 1925, 1.11.

1062. [illegible]

[illegible] 1924, 1.6

Микеладзе Шалва Антонович. Материалы для изучения клейкости и свертываемости крови при малярии.

Защ. 1924, 1.6.

1063 [illegible] 1925 XV 362 გვ. 400 ც.

[illegible] 1925, 29.3.

Жгенти Владимир Каплонович. Гланды. Морфологическое исследование 1925 XV, 362 с. 400 экз.

Защ. 1925, 29.3

1064 [illegible] (ტფ. მოამბე, ტ. 8, 1928)

[illegible] 1928, 12.2.

Сахвпрелидзе Семен Захарович. К морфологии эпителия слизистой оболочки ободочной кишки человека (Изв. ТГУ, т. 8, 1928)

Защ. 1928, 12.2.

1065 [illegible] 1924, [5], 231 გვ., ილ. 400 ც.

[illegible] 1924, 11.4.

Кипшидзе Семен Никифорович. Материалы к патологии большого мозга. 1924. [5], 231 с., илл. 400 экз.

Защ. 1924, 11.4.

1066 [illegible] 1927, [4], 161 გვ.

[illegible] 1929, 29.5.

Цецхладзе Владимир Караманович. Морфологические особенности большого сальника человека и их значение для определения функций данного органа. ТГУ, 1927, [4], 161 с.

Защ. 1929, 29.5.

1067. [illegible] 1921 XI, 140 გვ. 509 ც.

[illegible] 1921, 26.6

Цинамдзгвришвили Михаил Дорофеевич. Материалы к химии хондроитин серной кислоты и к ее обнаружению в моче при брюшном тифе. Тб., 1921 XI, 140 с. 500 экз.

Защ. 1921, 26.6

1068 [illegible] 1925. [2], 87 გვ.

[illegible] 1925, 21.6.

Цуладзе Александр Петрович. К вопросу о предохранительных свойствах большого сальника при некоторых патологических процессах брюшной полости. Экспериментальное исследование. 1925. [2], 87 с.

Защ. 1925, 21.6.

728

Dissertation for degree of Doctor Medical Sciences

Dct. at Tbilis. State U.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

[illegible], Sh. Ye.

[illegible]

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MI[illegible], S[illegible] Ye. Continued

O kornyakh funktsii, opredel[illegible] [illegible]
[illegible] (19[illegible]), [illegible]
Chislennyye metody inte[illegible] [illegible]
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O chislenno[illegible] inte[illegible]rirov[illegible] nekoto[illegible] [illegible]
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Rashevshiy, P.K.
Moscow-Leningrad, 1948

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

VII ფიზიკა-მათემატიკური მეცნიერებანი

VII. ФИЗИКО-МАТЕМАТИЧЕСКИЕ НАУКИ

I. [illegible]. Математика

[illegible]

a) На степень доктора наук

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Защ. 1935, 24 3.

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695 Халилов Заид Исмаил Оглы. Краевые задачи для обобщения полигармонических уравнений. Баку. 1945 [2], 93 с. (Азерб госуниверситет). Изв Аз ФАН СССР 1943, № 1 Изв АН Азерб ССР, 1946, № 10. Тр сект матем АН Азерб ССР, 2, 1946. Докл АН СССР, т 51 № 3, 1946, т 54, № 7. Изв АН СССР т 11, 1947 Тр НИИ матем и физ АГУ т 1, 1949. Тр прикл. матем и тех т 14, 6 4 1950 Тр сект матем АН Азерб. ССР 1, 1945

Защ 1946, 3 6.

[illegible]

Dissertation for degree of

Doctor Mathematical Sciences

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

Numerical Methods for the Integration of Partial Differential Equations

Izd-vo Akad. Nauk SSR, 1936.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

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Teoriya i praktika interpolirovaniya (na gruz. Yaz.) Tbilisi, (1946), 1-393.

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edited by Kurosh, A.G.,
Markushevich, A.I.,
Rashevskiy, P.K.
Moscow-Leningrad, 1948

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MIKELADZE, Sh. Ye.

"The Problem of Longitudinal Bending of Rectilinear Rods within the Limits of Elasticity,"
Trudy Math. Inst. im Razmadze, Acad. Sci. Geo SSR, Vol 12, 1943
(Soob. AN Geo SSR, Vol 7, No 3, 1946.

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Mikheladze, S.

Mikheladze, S. An approximate method for the integration of the differential equation for the bending of a beam. Bull. Acad. Sci. Georgian SSR [Soobshchenia Akad. Nauk Gruzinskoi SSR] 6, 97-104 (1945). (Georgian. Russian summary)

The method of finite differences is used to integrate numerically the differential equation for the deflection of a beam with variable modulus of rigidity.

L. S. Sakolnikoff (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol. 8 No. 6

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

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MIKHELADZE, Sh.

Mikheladze, Sh. On the subtabulation of mathematical tables. Bull. Acad. Sci. Georgian SSR [Soobščenia Akad. Nauk Gruzinskoi SSR] 6, 397–405 (1945). (Georgian and Russian)

The author considers the problem of the m-fold subtabulation of a table of $f(x)$ originally given for $x=a+kh$ $(k=0, 1, 2, \cdots)$ to obtain a table for the arguments $x=a+kh_1$, where $h_1=h/m$. Formulas are given for forward, backward and central differences with remainders after r terms expressed in terms of the $(r+1)$th derivative of $f(x)$.

D. H. Lehmer (Berkeley, Calif.).

Source: Mathematical Reviews, Vol 1 No. 5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

Mikheladze

Mikheladze, Š. On a process of interpolation for functions of two variables. Bull. Acad. Sci. Georgian SSR [Soobščenia Akad. Nauk Gruzinskoĭ SSR] 6, 503-509 (1945). (Georgian. Russian summary)

The author presents the usual two-variable interpolation formula in terms of differences for a right triangular array of points in the (x, y)-plane. The formula is given in four different forms correspondingly to the four possible orientations of the right triangle, i.e., right angle in the N.W., N.E., S.W. or S.E. corner. W. E. Milne (Corvallis, Ore.).

2

Source: Mathematical Reviews. Vol. No. 87

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, SH.

"On Numerical Integration," Dok. AN, 49, No. 3, 1945. Math. Inst. Acad. Sci., c1945-.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

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MIKELADZE, Sh. Ye.

"General Equation of the Elastic Line of a Beam," Dokl. AN SSSR, 50, pp. 117-19, 1945

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

Mikeladze, Sh. Ye.

Sh. Ye.

~~Mikeladze, Sh. E.~~ Résolution des problèmes limites au ~~moyen de la formule~~ généralisée de MacLaurin. C. R. (Doklady) Acad. Sci. URSS (N.S.) 52, 753-755 (1946).

The author shows that every linear nonhomogeneous equation of the form $y^{(n)}+X_1y^{(n-1)}+\cdots+X_ny=f(x)$, where the functions $X_1, \ldots, X_n$ and $f(x)$ are continuous, can be reduced to a Volterra integral equation of the second kind, if one knows the initial values at $x=0$, the points of jump discontinuity of the solution y and its $n-$ derivatives and the magnitude of the jumps at these points.

R. Bellman (Princeton, N. J.).

Source: Mathematical Reviews Vol 8 No. 6

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELA[illegible]ZE, S. E.

PA [illegible]

USSR/Equations, Differential Equations, Linear

Mar 1947

"Discontinuous Solutions for Ordinary Linear Differential Equations," S. E. Mikeladze, 4 pp

"CR Acad Sci" Vol LV, No 9

Theorem and mathematical proof.

8T71

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

Certain Problems of Construction Mechanics

Moscow-Leningrad, 1948.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. E.

Source: Mathematical Reviews, Vol 10 No. 8

Mikeladze, Š. E. Numerical integration. Uspehi Matem. Nauk (N.S.) 3, no. 6(28), 3–88 (1948). (Russian)

This is an exposition of numerical differentiation and integration, with some applications to the solution of ordinary differential equations. Formulas for differentiation with and without differences are derived in the first chapter. Some sections are devoted to related topics, so that the derivations are essentially complete. Then a longer chapter is used for quadrature formulas, including formulas of Gauss, Čebyšev, and Markov, and a discussion of S. N. Bernstein's work on quadrature formulas. Sections are also devoted to integrals of the type $\int_a^b F(x)f(x)dx$ and to Stieltjes integrals.

Quadrature formulas involving fixed ordinates are found from an interpolation formula stated to have been previously derived by the author in a book in Georgian. To get this formula, the Taylor series for $y^{(n+1)}(x)$, with powers of $x-A$, is integrated over the interval (A, x). When the integrand in the remainder term is replaced by Lagrange's interpolation formula, Mikeladze's general formula for $y^{(k)}(x)$ is obtained. In the third chapter, the author uses special cases of this formula to solve ordinary differential equations by a method analogous to that of Adams. Since different derivatives, differences and ordinates appear in the same quadrature formula, his method generalizes that of C. Störmer [see Bennett, Milne, and Bateman, Bull. Nat. Res. Council, no. 92 (1933), p. 82] and one attributed to A. N. Krylov. Finally, two sections are devoted to the author's iteration method for numerical integration of differential equations.

R. E. Gaskell (Ames, Iowa).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh.E.

Mikeladze, Š. E. On the evaluation of determinants whose elements are polynomials. Akad. Nauk SSSR. Prikl. Mat. Meh. 12, 219–222 (1948). (Russian)

If $F(\lambda)$ is the value of a determinant of order n whose elements are polynomials in λ then $F(\lambda)$ is a polynomial of degree k and can be expressed in finite form by Taylor's series. The requisite coefficients $F^{(m)}(0)$ are found by the formula $F^{(m)}(0)=\sum_{\nu=0}^{k}A_{m\nu}\Delta^{\nu}F(0)$, where $\Delta^{\nu}F(0)$ is the νth difference obtained from $F(0), F(1), \cdots, F(k)$. The remainder of the paper supplies the numerical values of the coefficients $A_{m\nu}$ for $m=1$ to 20, $\nu=m$ to 20.

W. E. Milne (Corvallis, Ore.).

Source: Mathematical Reviews, Vol 9 No. 10

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

38

Mikeladze, Š. E. Longitudinal-transverse bending of a beam on an elastic foundation. Doklady Akad. Nauk SSSR (N.S.) 59, 451–454 (1948). (Russian)

The equation of the central line of an elastic beam, resting on a yielding foundation and subjected to a constant compressive load and varying transverse load, is obtained in the form of a rapidly converging trigonometric series.

I. S. Sokolnikoff (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 9 No. 8

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

Mikeladze, Sh. E.

Mikeladze, Š. E. New quadrature formulas and their application to the integration of differential equations. Doklady Akad. Nauk SSSR (N.S.) 61, 613-615 (1948). (Russian)

The author obtains by partial integration of

$$m!R_m = (-1)^m \int_a^b P_m(x) f^{(m)}(x)\,dx,$$

$$P_m(x) = x^m + c_1 x^{m-1} + \dots,$$

the general formula

$$-\int_a^b f(x)\,dx = \sum_{\nu=0}^{m} \frac{(-1)^{\nu-1}}{m!} [P_m^{(m-\nu)} f^{(\nu-1)}]_a^b + R_m.$$

He gives the polynomials for the quadrature formulas of Simpson, Euler-MacLaurin, Obreschkoff and Petr and calculates the formula using the Čebyšev polynomials. A boundary problem for $\varphi(x)$ is solved using appropriate polynomials.

E. M. Bruins (Amsterdam).

Source: Mathematical Reviews, Vol. 10 No. 5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

Mikeladze, Š. E. New formulas for the numerical integration of differential equations. Doklady Akad. Nauk SSSR (N.S.) 61, 789–790 (1948). (Russian)

The interpolation formula of Newton for $y(t)$ can be used not only with increasing abscissas $t_1 < \cdots < t_n$, but also with zigzagging abscissas $t_1, \cdots, t_n$. Representing $y(a+ht_p)$ by the Taylor formula with the initial value $y(a+ht_n)$ combined with a development of the integral for the remaining term according to Newton's interpolation formula with the abscissas $a+ht_i$, several different formulae can be obtained by permutation of the t_i. For example, $t_n=0$, $t_p=1$; $a, a+h, \cdots, a+rh$ gives $y^{(k)}(a+h)$ expressed by $y^{(p)}(a)$ and the mean kth order differences of $y^{(p)}(a+ht_i)$, $p \geq k$; $t_n=1$, $t_p=2$; $a+h, a, a+2h, \cdots, a+rh$ gives $y^{(k)}(a+2h)$; $t_n=2$, $t_p=3$; $a+2h, a+h, a, a+3h, \cdots, a+rh$ gives $y^{(k)}(a+2h)$, etc., in an analogous form. *E. M. Bruins* (Amsterdam).

Source: Mathematical Reviews, Vol 10 No. 7

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, SH. E.

USSR/Mathematics - Equations, Differential Mar 49
Mathematics - Integrals

"Numerical Integration of Differential Equations With the Help of Summation Formulas," Sh. E. Mikeladze, 4 pp

"Dok Ak Nauk SSSR", Vol LXV, No 2

Uses repeated summations to find numerical values of the integral of a differential equation of form $y^n=f(x,y,y',\ldots\ldots,y^{n-2})$, defined by the following initial conditions at $x = a$ in the interval (a,X): $y(a)=y_o'\ldots\ldots\ldots,y^{n-1}(a)=y_o^{n-1}$. Assumes existence of unknown integral has been previously established. Submitted by Acad A. N. Kolmogorov, 29 Dec 48.

39/49T56

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

Mikeladze, S. E.

2

Mikeladze, S. E. A new method for the solution of characteristic value problems. Doklady Akad. Nauk SSSR (N.S.) 66, 553–556 (1949). (Russian)

The author applies his method of solving linear differential equations with variable coefficients by reduction to Volterra integral equations [C. R. (Doklady) Acad. Sci. URSS (N.S.) 52, 753–755 (1946); these Rev. 8, 329] to characteristic value problems of mechanics. In particular, he discusses the transversely vibrating string with fixed ends and variable density, the linear deflection of a rod with variable axial load and one end free, a beam on an elastic support. Numerical results are given in special cases.

M. J. Gottlieb (Chicago, Ill.).

Source: Mathematical Reviews, Vol 11 No. 3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKALADZE, S. Ye.

New Method of Integration of Differential Equations," 1956.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. E.

3000

*Mikeladze, Š. E. Novye metody integrirovaniya differencial'nyh uravnenii i ih priloženiya k zadačam teorii uprugosti. [New methods of integration of differential equations and their application to problems in the theory of elasticity.] Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow-Leningrad, 1951. 291 pp. 11.50 rubles.

This book gives numerical methods for solution of buckling and vibration problems involving columns and shafts. The principal mathematical interest lies in the first chapter on boundary problems with linear differential equations. The author sets forth here several numerical methods of finding characteristic values, most of them taken from his own writings. These methods employ numerical formulas for integration and differentiation, many of them novel or at least uncommonly used, to construct an equation for the characteristic values of the system. In some cases, the system is converted to an integral equation, in others formulas for derivatives are used directly. Free use of unbalanced formulas is made. The chapters after the first are devoted to specific applications. The second chapter deals with buckling of columns with various types of end support and lateral restraint. No assumption as to uniformity of the cross-section is generally required. The four remaining chapters are much shorter, and deal with stability under loads distributed longitudinally, stability of curved beams, longitudinal vibrations of bars, and transverse vibrations of bars and strings.

R. E. Gaskell (Seattle, Wash.).

Source: Mathematical Reviews, Vol 13 No.9

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

1. MIKELADZE, SH. YE.

2. USSR (600)

4. Integrals

7. Integration and differentiation under the Denjoy integral sign. Soob AN Gruz SSR No. 7 1951.

9. Monthly List of Russian Accessions, Library of Congress, April [illegible]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Š. E.

Mathematical Reviews
Vol. 14 No. 7
July - August 1953
Analysis

Mikeladze, Š. E. A new integral method of solution of boundary problems. Soobščenija Akad. Nauk Gruzin. SSR 12, 393-396 (1951). (Russian)

In order to obtain the piecewise continuous solution $y(x)$, with piecewise continuous derivatives, of a linear differential equation the author uses a development

$$\ldots \sum_{\ldots} \frac{y^{(n-1)}(t)}{\ldots} x^{\ldots} + \sum_{\ldots} A_{\ldots} + \sum_{\ldots} B_{\ldots}(x - a_{\ldots}) + \sum_{\ldots} Q_{\ldots}(x - a_{\ldots}) x^{\ldots} + \frac{1}{(n-1)!}\int_{a_{\ldots}}^{x} (x - t)^{n-1} y^{(n)}(t)\,dt$$

He substitutes in the last integral the nth derivative as given by the differential equation, eliminates, by partial integration, all derivatives of $y(x)$ and in this way transforms boundary problems to integral equations analogous to the equation of Volterra in the case of continuous functions.

E. M. Bruins (Baghdad)

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MIKELADZE, Sh. Ye.

[illegible] of [illegible] equation with [illegible] More interesting is the third section, in which the nonlinear equation is solved by a method [illegible] Milne's method for solution of an ordinary linear differential equation. The values [illegible] having been determined, [illegible] mated with a Steffensen open type formula and this estimate is improved with a closed type formula. A shorter discussion of a similar numerical procedure for finding characteristic values and functions follows. This article is entirely expository, reference being made to other works of the author for proofs and derivations. [illegible]

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, S. E.

Mathematical Reviews
Vol. 14 No. 9
October 1953

Numerical and graphical
methods

Mikeladze, S. E. Approximate formulas for multiple integrals. [illegible] Akad. Nauk Gruzin. SSR 13, 193-200 (1952). (Russian)

For expressing the integral

$$\iint_D f(x, y)\,dx\,dy = \sum_{i=0}^{n} A_i f(a_i, b_i) + R$$

in such a way that R vanishes when f is a polynomial of given degree, the author expands $f(x, y)$ and relates the A_i to the integrals $\iint_D x^a y^b\,dx\,dy$ in the obvious manner. Some special consideration is given to the cases when D is a rectangle and a circle. — A. S. Householder

written from the Tbilisi Pedagogical Inst im A.S. Pushkin

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, SH. YE.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 424 - I

Call No.: AF617879

BOOK
Author: MIKELADZE, SH. YE.
Full Title: NUMERICAL METHODS OF MATHEMATICAL ANALYSIS
Transliterated Title: Chislennyye metody matematicheskogo analiza

Publishing Data
Originating Agency: None
Publishing House: State Publishing House of Technical and Theoretical Literature
Date: 1953 No. pp.: 527 No. of copies: 4,000
Editorial Staff
Contributor: Kinkladze, D. A., Junior Scientific Collaborator of the Mathematical Institute im. A. M. Razmadze of the Academy of Sciences, Gruzinskaya SSR who calculated the greater part of the tables.

Text Data
Coverage: The table of contents fully covers the subject matter. The book includes 28 graphs and 115 tables. The text was compared with: 1) W. E. Milne's Numerical Calculus (1949); 2) J. B. Scarborough's Numerical Mathematical Analysis (1950); 3) J. F. Steffensen's Interpolation (1950); 4) J. L. Walsh's Interpolation and Approximation (1935); 5) E. C. Titchmarsh's The Theory of Functions (1932); 6) E. T. Whittaker's and G. N. Watson's A Course

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

in Modern Analysis (1943); and 7) E. A. Guillemin's The Mathematics of Circuit Analysis (1949). Extensive comparison reveals nothing new or not covered in the above texts.

The book appears to have the character of a compilation, as evidenced by the extensive list of references. The text tends to cover not only the subject of numerical mathematical analysis, but also topics of the general theory of functions, circuit analysis, Fourier series and operational calculus. This makes its scope of coverage unusually wide. In its definitions, deductions of formulae and laconic statements it seems to be inferior to the English texts of Scarborough, Milne and Steffensen, which are often referred to by the author in the text. A thorough knowledge of higher mathematics is a prerequisite.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

Chislennyye metody matematicheskogo analiza AID 424 - I

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Fourier series. Development of a function composed of several polynomials into a Fourier series. Krylov's method of improving the convergence of trigonometrical series. Examples. Legendre polynomials. Legendre differential equation. Orthogonality. Iterated (recurrent) formula. Geometrical properties of Legendre polynomials. Normalizing factor. Development into Legendre polynomials. Convergence in the point of disruption. Uniform convergence of Legendre series. Computation of an integral with a variable limit. Formulae for computation of multiple integrals. Practical harmonic analysis. Computation of an integral of a function dependent on the parameter. Multiple Fourier series. Series of products of cosines and sines.

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Ch. XIII Numerical Integration 298-412

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differences. Steklov's investigation of convergence of quadrature formulae. Approximate calculation of improper integrals. Quadrature formulae with derivatives of the integrand. Method of indefinite coefficients. Formulae for approximate calculation of multiple integrals. Inequalities for evaluation of definite integrals.

Ch. XIV Euler's Summation Formula 413-432
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Simplifying Gauss' summation formulae. Tabulation of an indefinite integral. Summation formulae for iterated integration.

Ch. XVII Interpolation of Functions of Many Variables 462-480
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Ch. XVIII Cubature Formulae 481-508
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Ch. XIX Symbolic Calculus 509-513
Symbolic polynomials. Operator of displacement. Infinite series of operators. Application of operational calculus.

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Connection of a difference operator with a differentiation operator. General remarks.

Literature cited 514-521

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Purpose: The book is dedicated to science students and persons interested in the application of mathematics to questions of engineering.

Facilities: Mathematical Institute of the Academy of Sciences, Gruzinskaya SSR

No. of Russian and Slavic References: 48 Russian (after 1939) of a total of 162.

Available: A.I.D., Library of Congress.

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MiKeLAdze, Sh. E.

3

629. Mikeladze, Sh. E., Numerical solution of boundary problems for [illegible] differential equations (in Russian), *Soobshchen. Akad. Nauk Gruzin SSR* 14, 3, 133–137, 1953 (translated from Russian by M. D. Friedman, 572 California St., Newtonville, Mass., 6, pp.)

Author describes a procedure for the reduction of a nonlinear ordinary differential equation to a family of nonlinear algebraic equations which can be solved by conventional iterative methods. The described procedure uses numerical quadrature rather than numerical differentiation. The method is used to compute the deflection of a rod, compressed by forces exceeding the Euler critical force.

Reviewer believes that the method may be of value in certain engineering applications and should complement other well-known numerical methods for the solution of boundary-value problems. It is likely that the convergence of the method may depend on the quadrature formulas used.

G. C. Wallick, USA

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MIKELADZE, ~~Sh. Ye~~. Sh. Ye

1 - F/W

Mikeladze, Š. E. Stability of an elastic plate of variable thickness in a uniaxial stressed state. Akad. Nauk Gruzin. SSR. Trudy Tbiliss. Mat. Inst. Razmadze 19, 211–224 (1953). (Russian. Georgian summary)

A rectangular plate, whose side dimensions are a parallel to the x axis and b parallel to y, is compressed in the x direction by an arbitrary distribution of forces N_x acting along the sides parallel to y. The bending stiffness D may vary with y and may even be discontinuous in y. Assuming the form for the buckled shape w as a single wave: $w(x, y) = f(y) \sin \pi x a^{-1}$, the equilibrium equation and homogeneous boundary conditions on w lead to a fourth-order linear eigenvalue problem for $f(y)$. A general method is presented to transform the differential equation for f into an integral equation, and to obtain numerical results from the latter by finite differences and quadrature formulas. The method is demonstrated by determining the critical load for the uniform plate compressed by a uniformly distributed load (N_x and D constant) assuming that the unloaded edges are clamped. *W. Nachbar* (Van Nuys, Calif.).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

USSR/Mathematics - Interpolation 1 Jun 53

"Theory of Construction of Interpolational Formulas," Sh. Ye. Mikeladze, Tbilisi Math Inst, Acad Sci Georgian SSR

DAN SSSR, Vol 90, No 4, pp 503-506

Develops interpolational formulas, with differences of the function $y^{(n)}(x)$ of various kinds, from the eq $y(a+hT) = \sum_{k=0}^{n-1} (T-t)^k (h^k/k!) y^{(k)}(a+ht) + h^n/(n-1)! \cdot \int_t^T (T-t)^{n-1} y^{(n)}(a+xh)dx$, namely, by expanding

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$y^{(n)}(x)=f(x)$ in the differences $f(a)$, $\nabla f(a), \ldots, \nabla^p f(a) = \Delta^p f(a-ph)$, $\Delta^{p+1} f(a-ph)$, etc. Presented by Acad A. N. Kolmogorov 2 Apr 53.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, SH. YE.

USSR/Mathematics - Finite Differences 21 Sep 53

"Expansion of the Finite Difference of a Function in the Differences of its Derivative," Sh.Ye. Mikeladze, Math Inst, Acad Sci Georgian SSR

DAN SSSR, Vol 92, No 3, pp 479-482

Outlines a method for constructing the expansions of a function in the differences of its derivative. States that particular results were obtained earlier by M.F. Subbotin (Byul Sredneaz Gos Un-ta [Bull of Central Asia State Univ], No 16, 273 (1942); No 17, 21 (1928) [sic]) and 20 years later by W.G. Bickley using symbolic methods (J Math and Phys (Mass), 27, 3, 191 (1948)). Presented by Acad A.N. Kolmogorov 20 Jul 53.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, S.E.

Mikeladze, S. E. Remarks on the theory of discontinuous solutions of ordinary differential equations. Soobšč. Akad. Nauk Gruzin. SSR 15 (1954), 647–654. (Russian)

Let $Ly=0$ be a linear ordinary differential equation with continuous coefficient. The author has given [C. R. (Dokl.) Acad. Sci. URSS (N.S.) 55 (1947), 789–792; MR 9, 36] an expression in terms of a fundamental set of solutions for a solution with jump discontinuities in $y^{(k)}$ $(k=0, \cdots, n-1)$. Here he first extends this expression to cover the case (P) in which the coefficients depend also continuously on an arbitrary number of parameters. Next he discusses a boundary-value problem for a self-adjoint second-order equation, concluding that in case (P) the proper values of the parameters cannot be determined for a solution with assigned discontinuities, without supplementary conditions. The final section treats special equations soluble in closed form.

F. A. Ficken.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

USSR/Mathematics - Approximate solution of Cauchy problem FD-663

Card 1/1 : Pub. 85 - 18/20

Author : Mikeladze, Sh. Ye. (Tbilisi)

Title : Approximate solution of the Cauchy problem

Periodical : Prikl. mat. i mekh., 18, 244-249, Mar/Apr 1954

Abstract : Solves approximately the Cauchy problem for general nonlinear differential equations with initial data differentiable sufficient number of times. Refers to his book Chislennyye metody matematicheskogo analiza [Numerical methods of mathematical analysis], GITTL, 1953.

Institution : --

Submitted : December 17, 1953

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Mikeladze, Sh. Ye.

Sh. Ye.

2

1

Mikeladze, ~~S. E.~~ On discontinuous solutions of ordinary quasi-differential equations. Dokl. Akad. Nauk SSSR (N.S.) 105 (1955), 641-644. (Russian)

The equations are of the form

$$Ly \equiv \varrho_0 \frac{d}{dx} \varrho_1 \frac{d}{dx} \cdots \varrho_{n-1} \frac{d}{dx} \varrho_n y + py = 0,$$

Math

where the coefficients are continuous functions of $(x, \alpha, \beta, \cdots)$ ($\alpha, \beta, \cdots$ parameters) in a region including the interval $a \leq x \leq b$. The quasi-derivatives of y are defined thus: $y^{[0]} = p_n y$,

$$y^{[n-k]} = \varrho_k \frac{d}{dx} \varrho_{k+1} \frac{d}{dx} \cdots \varrho_{n-1} \frac{d}{dx} \varrho_n y \quad (k = 1, \cdots, n-1).$$

First a "fundamental" set of solutions is constructed at $x = s$. Then it is shown how to form a linear combination having, along with its quasi-derivatives, desired jumps at specified points in $[a, b]$. Next a solution is found for the nonhomogeneous equation $Ly = q(x, \alpha, \beta, \cdots)$. In conclusion, certain special cases are noted. *F. A. Ficksn.*

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VAL'FISH, A.Z., redaktor; MANDZHAVIDZE, G.F., redaktor; MIKELADZE, Sh.Ye., redaktor; MUSKHELISHVILI, N.I., otvetstvennyy redaktor; CHELIDZE, V.G., redaktor; CHOGOSHVILI, G.S., redaktor; KARACHKOV, S.R., tekhnicheskiy redaktor.

[Linear discontinuous boundary problems of the function theory, singular integral equations and some of their applications] Lineinye razryvnye granichnye zadachi teorii funktsii, singuliarnye integral'nye uravneniia i nekotorye ikh prilozheniia. Tiflis, Izd-vo Akademii nauk Gruz.SSR. 1956. 158 p. (Akademiia nauk Gruz.SSR. Matematicheskii institut. Trudy, vol. 23) (MLRA 10:5)

(Functions, Discontinuous)
(Integral equations)
(Functions of complex variables)

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SOV/137-57-6-9439

Translation from Referativnyy zhurnal, Metallurgiya, 1957, Nr 6, p 18 (USSR)

AUTHOR: Mikeladze, (No initials given)

TITLE: G N Nikoladze and the Didube Pilot Plant (G N Nikoladze i didubiyskiy opytnyy zavod) in Georgian

PERIODICAL: Tr Gruz politekhn in-t, 1956, Nr 1 (42), pp 29-34

ABSTRACT: A discussion is presented of the role of Prof Georgiy Nikolaevich Nikoladze in the design, construction, and breaking in of the Zestafoni Ferromanganese Plant using Chiatura ores A pilot plant with an 1125 kva 3-phase electric furnace was built in Tbilisi (Didube) in 1928 under Nikoladze's guidance to determine the technical procedures and other indices of production and economics The following questions were studied 1) Choice of the best reductant for electric melting of ferromanganese by comparison of Tkvibuli coals and Donbass coke; 2) use of limestone as flux instead of burnt lime, 3) the comparative economics of various ores from the Chiatura mine, 4) optimum granulation of the charge components, and 5) the effect of the working voltage on the smelting process, etc

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MIKELADZE, Sh.Ye.

On a review and remark following it. Usp.mat.nauk 11 no.3:241-242 My-Je '56. (MLRA 9:9)
(Calculus) (Zhukov, A.I.)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

Sh. Ye. 14 16

Mikeladze, ~~S. E.~~ Numerical integration of differential equations in the complex plane. Soobšč. Akad. Nauk Gruzin. SSR 17 (1956), 97–102. (Russian)

The author uses the same stype of quadrature formulas, applicable in the real case, to integrate numerically an ordinary differential equation of second order along some straight line in the complex plane. He also indicates the use of such methods for analytic continuation.

W. E. Milne (Corvallis, Ore.).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE Sh. Ye.

1-F\W

Mikeladze, S. E. Quadrature formulas for a regular function. Soobsc. Akad. Nauk Gruzin. SSR 17 (1956), 289-296. (Russian)

For an analytic function $f(z)$ of a complex variable the author gives a general quadrature formula of type

$$(*) \qquad \int_{a}^{a+H} f(z)\,dz = H \sum_{\nu=0}^{n} A_\nu f(a+t_\nu H) + R_n.$$

Assuming (*) is exact ($R_n=0$) for polynomials of degree n, the A_ν may be derived by integrating the Lagrange interpolation polynomial, or by undetermined coefficients. For various fixed points $(a+t_\nu H)$ the author derives known quadrature formulas of Salzer [J. Math. Phys. 29 (1950), 96-104; MR 12, 56], Birkhoff and Young [ibid. 29 (1950), 217-221; MR 12, 445], and Young [ibid. 31 (1952), 42-44; MR 13, 782, 1140]. If $f(z)$ is real for real z, the author fixes equal weights A_ν and finds formulas of the Chebyshev type

$$(**) \qquad \int_{-1}^{1} f(z)\,dz = \frac{2}{n} \sum_{\nu=1}^{n} \operatorname{Re} f(z_\nu).$$

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MIKELADZE, S.E.

exact for polynomials of degree n. A numerical example with $f(x)=e^{-x^2}$ and $n=10$ yields accuracy to 6 significant decimals.

New quadrature formulas are found with the points $a+ht_\nu$ at the center and vertices of regular polygons. Also, one for $\int_{-H}^{H} f(x)dx$ is given in terms of $f(0)$, $f(\pm H)$, $f(\pm 2H)$, $f(\pm iH)$, and $f(\pm 2iH)$. G. E. Forsythe.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, S.E.

Mikeladze, Š. E. Approximate formulas for the multiple integral of a regular function. Soobšč. Akad. Nauk Gruzin. SSR 17 (1956), 577-584. (Russian)

The point of departure is the reduction in the complex field of multiple integrals to single integrals by the formula:

$$(*)\quad \int_A^z \cdots \int_A^z w^{(n)}(z)\,dz^n = \{(n-1)!\}^{-1} \int_A^z (z-u)^{n-1} w^{(n)}(u)\,du.$$

The author then uses ideas developed in an earlier paper [same, Soobšč. 17 (1956), 289-296; MR 18, 479] to give methods of obtaining numerical integration formulas for the right side of (*), and hence for the left side of (*).

Formulas of both closed and open type are considered. In illustration the author gives numerical formulas for integrating $w' = dw/dz = f(z, w)$, $w'' = f(z, w, w')$, and $w'' = f(z, w)$ over a network in a complex region.

G. E. Forsythe (Stanford, Calif.).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, S. E.

Math

Mikeladze, S. E. Formulas of mechanical quadratures ~~for multiple integrals.~~ Akad. Nauk Gruzin. SSR. Trudy Tbiliss. Mat. Inst. Razmadze 22 (1956), 277–299. (Russian)

1-F\W

The special results cannot be summarized in a short space but the method is of interest. The relation to multiple integrals is incidental and occurs through the formula

$$\int_{x_0}^{x_1}\int_{x_0}^{\tau}\cdots\int_{x_0}^{\tau} f(\tau)d\tau^k = \frac{h^k}{(k-1)!}\int_{-1}^{1}(1-t)^{k-1}f(a+th)dt,$$

where $a=\frac{1}{2}(x_0+x_1)$, $h=\frac{1}{2}(x_1-x_0)$. After stating this the author considers integrals such as $\int_a^b p(x)f(x)dx$, first with finite limits, then with one or both limits infinite. In the latter cases p is taken to contain an exponential factor.

For a and b finite, the endeavor is to express the integral either, in the usual way, as a linear combination of the values of f at selected points, or else as a linear combination of its divided differences, and in either case to the highest possible order of accuracy. The method stems from the observation that if $x_1, x_2, \cdots, x_m$ are zeros of a polynomial $P_m(x)$ of degree m of the set of polynomials orthogonal with respect to the weight $p(x)$, and if $f(x)$ is expanded as a series in its divided differences

$$f(x_1), f(x_1, x), \cdots, f(x_1, x_2, \cdots, x_m), f(x_1, x_2, \cdots, x_m, x_1), \cdots,$$

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then when the series is substituted into the integral certain terms disappear as a result of the orthogonality. A simple extension of the notion permits treatment of cases where a limited number of relations are imposed upon the x_i, e.g. that certain ones are fixed.

A. S. Householder (Madison, Wis.).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh.Ye.

Review and accompanying remarks. Trudy Mat.inst.AN Gruz.SSR 22:319-338 '56. (MLRA 10:3)

(Numerical calculations) (Mathematics)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

Mikeladze, Sh. E.

2

1-F\W

Mikeladze, Sh. E. Numerical solution of the inhomogeneous polyharmonic equation. Inžen. Sb. 23 (1956), 190–202. (Russian)

The solution of the boundary value problem for the polyharmonic equation is discussed by the method of various types of grids. The existence and uniqueness of the solution of the linear system of simultaneous equations which are used to replace the partial differential equation are proved and the convergence of the solution of the approximate problem to the exact solution is discussed.

C. Saltzer (Syracuse, N.Y.).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh. Ye.

Quadratic formulas for multiple integrals having the highest degree of precision. Soob. AN Gruz. SSR 18 no.1:3-10 Ja '57. (MLRA 10:5)

1. Akademiya nauk Gruzinskoy SSR, Tbilisskiy matematicheskiy institut im. A.M. Razmadze. 2. Tbilisskiy gosudarstvennyy universitet imeni Stalina. Chlen-korrespondent Akademii nauk Gruzinskoy SSR.

(Integrals, Multiple)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh.Ye.

Numerical differentiation in the complex region. Soob. AN Gruz.SSR 18 no.4:385-392 Ap '57. (MLRA 10:7)

1. Akademiya nauk Gruzinskoy SSR, Tbilisskiy matematicheskiy institut im. A.M.Razmadze. Chlen-korrespondent Akademii nauk Gruzinskoy SSR.
(Functional analysis) (Integral equations)
(Differential equations)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh.Ye.

Approximate solution of the system of nonlinear equations.
Soob. AN Gruz. SSR 20 no.6:647-653 Je '58. (MIRA 11:10)

1.AN Gruzinskoy SSR, Tbilisskiy matematicheskiy institut im. A.M. Razmadze i Tbilisskiy gosudarstvennyy universitet imeni Stalina. Chlen-korrespondent AN Gruzinskoy SSR.
(Differential equations)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001033910020-2

MIKELADZE, Sh.Ye.

Some iterations of higher orders. Soob. AN Gruz. SSR 22 no.3: 257-264 Mr '59. (MIRA 12:8)

1.AN GruzSSR, Tbilisskiy matematicheskiy institut im. A.M. Razmadze i Tbilisskiy gosudarstvennyy universitet im. Stalina, chlen-korrespondent AN GruzSSR.
(Integrals)

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MIKELADZE, Sh.Ye.

General method for the numerical solution of differential equations. Soob.AN Gruz.SSR 22 no.5:513-518 My '59. (MIRA 12:11)

1. Akademiya nauk Gruzinskoy SSR; Tbilisskiy matematicheskiy institut im. A.M.Razmadze; Tbilisskiy gosudarstvennyy universitet imeni Stalina, chlen-korrespondent AN Gruzinskoy SSR.
(Differential equations)

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AUTHOR: Mikeladze, Sh. Ye.

TITLE: The method of parameter variation for the solution of equations

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 37, abstract 8V237 ("Soobshch. AN Gruz SSR", 1959, 23, no. 1, 3-9)

TEXT: The author considers the equation

$$z = \sum_{\nu=0}^{m} a_\nu f_\nu(z) \qquad (1)$$

where the functions $f_\nu(z)$ are regular in the domain G containing the simple root $z = \alpha$ of (1), and a_ν are imaginary numbers. p-m auxiliary functions $f_\nu(z)$ with vanishing coefficients a_ν are introduced into the equation (1):

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The method of parameter variation for

$$z = \sum_{\nu=0}^{p} a_\nu f_\nu(z)$$

where it is assumed that the auxiliary functions are different from zero in the point α. The author understands the a_ν as independent variables, differentiates (2) with respect to these variables and obtains an iteration formula for the solution of (1). In the case of the variation of one coefficient a_k this formula has the form:

$$z = \varphi(z) \equiv z - \rho(z)\,\omega(z)$$

where

$$\omega(z) = \sum_{\nu=0}^{m} a_\nu f_\nu(z) - z,$$

$$\rho(z) = \frac{f_k(z)}{\omega'(z) f_k(z) - \omega(z) f'_k(z)} \qquad f_k(\alpha) \neq 0$$

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The method of parameter variation for [illegible]

Since $f'(\alpha) = 0$, the iteration process converges in a certain neighborhood of α if the initial approximation z_0 lies in this neighborhood. In the case $f_k(z) = \text{const}$ one obtains the known iteration formula of Newton. As special case for $z=x$, $m=1$, $a_0=a_1=1$, $f_k(x)=x$, $f_0(x)=f(x)$ one obtains for the solution of the equation $f(x)=0$ the iteration formula

$$x_n = \left[1 + \frac{f(x_{n-1})}{f(x_{n-1}) - x_{n-1} f'(x_{n-1})}\right] x_{n-1}$$

It is applicable where Newton's formula becomes senseless. An iteration formula for determining the zeros of a polynomial is given also for the case that all zeros are real and simple. Numerical examples are given.

[Abstracter's note: Complete translation.]

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AUTHOR: Mikeladze, Sh. Ye.

TITLE: Boundary value and eigenvalue problems for quasidifferential equations

PERIODICAL: Referativnyy zhurnal, Matematika, [illegible], 1961, 4[illegible], abstract 8B193 ("Tr. Tbilisk. matem. in-ta AN Gruz SSR", 1959, 26, 241-261)

TEXT: The author considers the quasidifferential equation

$$\rho_0 \frac{d^{2n}}{dx^{2n}} \rho_1 \frac{d^{2n}}{dx^{2n}} \quad \rho_n \cdot \frac{d^{2n}}{dx^{2n}} \rho_n y + py = 0 .$$

The quasinormal fundamental [illegible] of the solutions and the general discontinuous solution [illegible] are defined. These definition are generalizations of [illegible] given by the author (Mikeladze, Sh. Ye., Nekotoryye zadachi [illegible] mekhaniki [Some problems of structural mechanics] GITTL, [illegible]). Methods for determining the mentioned

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Boundary value and eigenvalue C111/C[illegible]

solutions are discussed. As an example the author considers the equation of an elastic beam of variable cross section.
[Abstracter's note: Complete translation.]

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C111/C333

AUTHOR: Mikeladze, Sh. Ye.

TITLE: Numerical solution of ordinary differential equations with the aid of polynomials

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 30-31, abstract 8V208 ("Tr. Tbilisis matem. in-ta AN Gruz. SSR", 1959, 26, 263-284)

TEXT: For the solution of the Cauchy problems, boundary value problems and eigenvalue problems the author proposes a method consisting in reducing the differential equations to systems of algebraic or transcendental equations with the aid of the polynomials of Bernshteyn. Here the theorem of S. N. Bernshteyn on the uniform approximation on [0,1] of a continuous function y(x) by polynomials

$$\sum_{\varrho=0}^{p} A_\varrho(x)\, y\left(\frac{\varrho}{p}\right) \quad (p \geqslant 1), \tag{1}$$

where $A_\varrho(x) = \binom{p}{\varrho} x^\varrho (1-x)^{p-\varrho}$, is essentially used, as well as the

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Numerical solution of ordinary . . . S/044/61/000/008/029/039
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theorem on uniform approximation on $[0,1]$ of the continuous derivatives of $y(x)$ by the derivatives of corresponding order of the polynomials (1). In the case of an equation of first order

$$y' = f(x,y) \qquad (2)$$

with the initial condition $y(0) = 0$ the polynomial $y'(x) = \sum_{\varrho=0}^{p} A'_{\varrho}(x)\, y\left(\frac{\varrho}{p}\right)$ is substituted into (2) and x is replaced by $x = \varrho/p$ ($\varrho = 0, 1, \ldots, p$); this leads to the system of $p+1$ equations with the p unknowns $y_{\varrho} = y(\varrho/p)$:

$$A'_0\left(\frac{\varrho}{p}\right) y_0 + A'_1\left(\frac{\varrho}{p}\right) y_1 + \ldots + A'_p\left(\frac{\varrho}{p}\right) y_p = f\left(\frac{\varrho}{p}, y_{\varrho}\right)$$

It is shown that this system contains p equations with a coefficient determinant different from zero. The proposed method is also applicable to systems of differential equations and to differential equations of order n. An equation of second order is considered as example. In the case of boundary value problems (for a system or for an equation of order n) the boundary conditions must be taken into account for the

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Numerical solution of ordinary . . S/044/61/000/008/029/039
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set-up of the linear system. The application of the method to eigenvalue problems is explained by the example of the differential equation

$$y^{(n)} + X_1(x,\lambda)\, y^{(n-1)} + \dots + X_n(x,\lambda)\, y = X(x,\lambda)$$

with the boundary conditions

$$\sum_{k=0}^{n-1} \alpha_{ki} y^{(k)}(0) + \sum_{k=0}^{n-1} \beta_{ki} y^{(k)}(1) = \gamma_i$$

$$(i = 1, 2, \dots, m \geq n).$$

Here the coefficients α_{ki}, β_{ki} can also depend on λ; assume that $X_1, \dots, X_n$, X, α_{ki}, β_{ki} and the γ_i are unique and continuous with respect to x and λ in a certain domain of the space (x, λ). In the equation and in the boundary conditions the function and its derivatives are replaced according to the formula

$$y^{(k)}(x) = \sum_{\varrho=0}^{p} A_\varrho^{(k)}(x)\, y\left(\frac{\varrho}{p}\right)$$

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Numerical solution of ordinary . . . S/044/61/000/008/029/039
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the corresponding x-values are chosen from the interval $[0,1]$ and one obtains a homogeneous system of equations. If its determinant is put equal to 0, then one obtains an equation for the determination of the sought eigenvalues λ. As an example the author considers the problem $y'' + \lambda xy = 0$, $y(0) = y(1) = 0$. He describes the application of the proposed method to Volterra integral equations of second kind, to Fredholm integral equations and to some integro-differential equations. At the end of the paper there are given tables of the values of the polynomials $A_\varrho(x)$ and of their derivatives $A_\varrho^{(k)}(x)$ ($k = 0, 1, \ldots, 4$; $\varrho = 0, 1, \ldots, 10$) for $x = \varrho/10$ ($\varrho = 0, 1, \ldots, 10$)

[Abstracter's note: Complete translation]

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26.5100

AUTHOR: Mikeladze, Sh. Ye.

TITLE: Numerical solution of the equation of heat conduction

SOURCE: Akademiya nauk Gruzinskoy SSR. Matematicheskiy institut. Trudy, v. 27, 1960, 367 - 410

TEXT: The author investigates two methods of solving the equation $\partial u/\partial t = a^2 \partial^2 u/\partial x^2$ numerically (and more general equations of the same type). Applying the first method he replaces this equation by the following system of difference equations: $U_{i,k+1} = (1 - 2/\lambda)U_{i,k} + (U_{i-1,k} + U_{i+1,k})/\lambda$. The second method is algebraic: The equation $\partial u/\partial t = a^2 \partial^2 u/\partial x^2$ is replaced by [illegible] $(6 - \lambda)U(x - h, t + [illegible]) = [illegible] + 10\lambda)U(x, t + [illegible]) + (6 - \lambda)U(x + h, t + [illegible]) + (6 + \lambda)U(x - h, t) + [illegible] + 10\lambda)U(x, t) + (6 + \lambda)U(x + h, t) + [illegible]$ ($\lambda = h^2/la^2 \neq 6$). For both methods formulas are derived for error estimation. The author compares his results with those of other authors P. P. Yushkov (Trudy instituta energetiki AN Belorusskoy SSR, vyp. 6, M., Card [illegible]

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Numerical solution of the equation of

[illegible]; Trudy Leningradskogo instituta khlodilnoy promyshlennosti [illegible] 1953; Prikladnaya matematika i mekhanika t. 12, 1948; and D. Yu. Panov (Spravochnik po chislennomu resheniyu differentsial'nykh uravneniy v chastnykh proizvodnykh. Handbook for the numerical solution of partial differential equations -, M.-L., 1938) are referred to. There are 2 figures, 3 tables and 24 references: 19 Soviet and 5 non-Soviet. The four references to English-language publications read as follows: L. F. Richardson, The approximate arithmetical solution by finite differences of physical problems involving differential equations with an application to the stresses in a masonry dam. Philosoph. Trans. Roy. Soc. London, ser. A, vol. 210, [illegible]; Kaj L. Nielsen, Methods in numerical analysis. The Macmillan Company, New-York, [illegible]; W. E. Milne, Numerical solution of differential equations. John Wiley Sons, In New York, [illegible]; Andrew D. Booth, Numerical methods. Butterworths Scientific Publications, London, [illegible]

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