

Summaries of articles published in this issue

Czechoslovak Mathematical Journal, Vol. 21 (1971), No. 2, 349,(350)–(351)

Persistent URL: <http://dml.cz/dmlcz/101028>

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SUMMARIES OF ARTICLES PUBLISHED IN THIS ISSUE

(Publication of these summaries is permitted)

OLDŘICH KOWALSKI, Praha: *Immersions of Riemannian manifolds with a given normal bundle structure*, Part II. Czech. Math. J. 21 (96), (1971), 137–156. (Original paper.)

In the previous part we have characterized a maximal isometric immersion of a Riemannian manifold M into Riemannian space N with the constant curvature by a system of metric tensors h_1, h_2, \dots, h_r on M . In the present paper we consider a new system of tensors B_1, \dots, B_r on M called Bompiani forms, giving a modern interpretation of them. We also introduce an alternative definition of that structure which was called by E. Bompiani "a Riemannian geometry of genus r ". As a basic result, in the maximal case we show the equivalence of our definition with the classical one.

KAREL HAVLÍČEK, Praha, JÜRGEN TIETZE, Aachen: *Zur Geometrie der endlichen Ebene der Ordnung $n = 4$* . Czech. Math. J. 21 (96), (1971), 157–164. (Originalartikel.)

Die Geometrie der 6-fach homologischen Dreiecke in der endlichen Ebene der Ordnung $n = 4$ wird direkt aus dem zugehörigen Inzidenzschema dieser Ebene hergeleitet.

JOHN G. BERGMAN, Newark: *A duality theorem for standard threads*. Czech. Math. J. 21 (96), (1971), 167–171. (Original paper.)

The characters of a topological group are continuous complex-valued homomorphisms for the simple reason that no continuous non-trivial real-valued characters exist. In the case of a topological semigroup the situation is very different since there are semigroups for which no continuous non-trivial semicharacters exist. One approach is to consider equivalence classes of measurable complex-valued semicharacters. In the paper it is shown that by considering such equivalence classes for real-valued semicharacters a Pontrjagin type of duality theorem can be obtained for a certain class of semigroups.

IVO VRKOČ, Praha: *Some explicit conditions for maximal local diffusions in one-dimensional case*. Czech. Math. J. 21 (96), (1971), 236–256. (Original paper.)

Let an Ito equation $dx = a(t, x) dt + B(t, x) dw(t)$ be given in a region $Q = (0, T) \times D$. $P(B, a, x_0, Q)$ is the probability that the solution with the initial value x_0 leaves the region D during the time interval $\langle 0, T \rangle$. The matrix function $B(t, x)$ is strongly maximal with respect to $a(t, x)$ and Q , if $P(B, a, x_0, Q) \geq P(\tilde{B}, a, x_0, Q)$ for $B(t, x) B^T(t, x) \geq \tilde{B}(t, x) \cdot \tilde{B}^T(t, x)$ (i.e. $BB^T - \tilde{B}\tilde{B}^T$ is positive semidefinit, B^T is the transpose matrix). In the case of one scalar Ito equation conditions for strong maximality of $B(t, x)$ are given which depend only on $a(t, x)$, $B(t, x)$ and the size of Q . For $n = 2$ it is proved that if $B(t, x)$ is strongly maximal with respect to Q (and arbitrary $a(t, x)$), then D has to be convex region with tangent at every point of frontier.

ŠTEFAN SCHWABIK, Praha: *Verallgemeinerte gewöhnliche Differentialgleichungen; Systeme mit Impulsen auf Flächen II*. Czech. Math. J. 21 (96), (1971), 172—197. (Originalartikel.)

Der Artikel ist eine Fortsetzung der Untersuchungen des Verfassers (Czech. Math. J. 20 (95), (1970), S. 468—490) über nichtlineare Differentialgleichungssysteme, deren Lösungen Unstetigkeiten haben, wenn diese gewisse Flächen treffen. Für Systeme dieser Form wird die stetige Abhängigkeit von einem Parameter dargelegt.

ŠTEFAN SCHWABIK, Praha: *Stetige Abhängigkeit von einem Parameter für ein Differentialgleichungssystem mit Impulsen*. Czech. Math. J. 21 (96), (1971), 198—212. (Originalartikel.)

Eine Untersuchung der stetigen Abhängigkeit von einem kleinen Parameter für ein Differentialgleichungssystem mit, auf einem Flächensystem vorgegebenen, Impulsen; es wird eine, der Bogoljubov-Krylovschen Mittelwertannäherung ähnliche, Behauptung bewiesen.

JAROSLAV KREJZLÍK, Brno: *Deformations of plane pseudocongruences with projective connection*. Czech. Math. J. 21 (96), (1971), 213—233. (Original paper.)

In the paper some elementary properties of special König space \mathcal{P}_{25}^3 are studied. This space is called the plane pseudocongruence with projective connection and the study is restricted to the case when all three focal varieties are of the dimension three. At first the moving frame of a pseudocongruence is specialized, notion of dualization, asymptotic curves of focal varieties and fundamental invariant forms are introduced. After this preliminary part the developable correspondences between two pseudocongruences and the induced correspondences between their dualizations and focal varieties are studied. Among developable correspondences the most important are point, hyperplanar and focal deformations. The individual elementary transformations are characterized by equality of corresponding fundamental invariant forms. Further the projective deformation of the second order is introduced. In all the cases the collineations realizing the individual correspondences are calculated and, making use of them the relations between the projective deformation of the second order, point and hyperplanar deformations and their collineations are studied. Finally, the singular deformation is introduced and individual cases of singular deformations are studied.

JAN STANISLAW LIPÍŃSKI, Gdańsk: *Über eine Frage von Herr L. Mišík*. Czech. Math. J. 21 (96), (1971), 234—235. (Originalartikel.)

Verfasser gibt eine positive Antwort auf beide Fragen, die Herr L. Mišík in seinem Artikel in Czech. Math. J. aus dem Jahre 1969 gestellt hat.

BŘETISLAV NOVÁK, Praha: *Über eine Methode der Ω -Abschätzungen*. Czech. Math. J. 21 (96), (1971), 257—279. (Originalartikel.)

Die Arbeit beschreibt eine einfache Ω -Methode, mit deren Hilfe man leicht eine reihe von definitiven Ergebnissen in der Theorie der Gitterpunkte in mehrdimensionalen Ellipsoiden erreichen kann.

Bohdan Zelinka, Liberec: *Homogeneous digraphs*. Czech. Math. J. 21 (96) (1971), 280–290. (Original paper.)

A homogeneous digraph is a digraph G in which the following three conditions are satisfied: (1) To any two vertices u, v of G an automorphism φ of G exists such that $\varphi(u) = v$. (2) If h_1, \dots, h_k are edges outgoing from a vertex u of G , then to any permutation p of the number set $\{1, \dots, k\}$ there exists an automorphism ψ_p of G such that $\psi_p(u) = u$, $\psi_p(h_i) = h_{p(i)}$ for $i = 1, \dots, k$. (3) If h'_1, \dots, h'_l are edges incoming into a vertex u of G , then to any permutation p' of the number set $\{1, \dots, l\}$ there exists an automorphism $\psi'_{p'}$ of G such that $\psi'_{p'}(u) = u$, $\psi'_{p'}(h'_i) = h'_{p'(i)}$ for $i = 1, \dots, l$. In this paper some results on these digraphs are obtained.

JAROSLAV MILOTA, Praha: *Universal almost optimal variational methods*. Czech. Math. J. 21 (96), (1971), 291–310. (Original paper.)

Formulae which are almost optimal and moreover universal for a large class of spaces play an important role in numerical analysis. In the paper it is proved that the Ritz method and the least square method for the boundary value problem with the commonly used coordinate functions have these properties. In this way results of the book Numerical processes in differential equations by Babuška I., Práger M., Vitásek E. are generalized. The main method used in this paper is based on the author's results related to the approximation of compact sets in H -spaces.

MILOŠ RÁB, Brno: *Equation $Z' = A(t) - Z^2$ coefficient of which has a small modulus*. Czech. Math. J. 21 (96), (1971), 311–317. (Original paper.)

The differential equation (1) $Z' = A(t) - Z^2$ is investigated, where $A(t)$ is a continuous complex-valued function defined on $\langle x_0, \infty \rangle$ which has a small modulus. By means of a parabolic family of circles (Ljapunov functions) asymptotic behaviour of trajectories of (1) is described.

KAREL REKTORYS, Praha: *On application of direct variational methods to the solution of parabolic boundary value problems of arbitrary order in the space variables*. Czech. Math. J. 21 (96), (1971), 318–339. (Original paper.)

The Dirichlet problem for parabolic equations is treated in a way permitting the application of direct variational methods similar to those applied to elliptic problems.

VÁCLAV ZIZLER, Praha: *Note on separation of convex sets*. Czech. Math. J. 21 (96), (1971), 340–343. (Original paper.)

A statement is proved concerning separation of two convex sets by two disjoint balls.

VÁCLAV HAVEL, Brno: *Near domains as linear pseudo ternaries*. Czech. Math. J. 21 (96), (1971), 344–347. (Original paper.)

Conditions are found under which a given linear pseudo ternary in the sense of R. Sandler becomes a Karzel's near domain.