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(These summaries may be reproduced)

BORIS GRUBER, Praha: *On the possibility of applying a computer when solving the four colour problem.* Apl. mat. 16 (1971), 83—97. (Original paper.)

The present paper introduces an algorithm which enables one to ascertain for any positive integer $n > 4$ whether every map consisting of n countries may be regularly stained by at most four colours.

LADISLAV HORA, Praha: *On the Somigliana's Formula.* Apl. mat. 16 (1971), 98—108. (Original paper.)

This paper deals with the general derivation of Pizzetti-Somigliana's formula for the decomposition of gravity. The problem of derivation is solved formally geometrically on the equipotential surface S that need not be the oblate ellipsoid of rotation. In individual cases of confocal systems of quadrics, the introouction of hyperbolic and circular functions in the equations of tri-orthogonal system is motivated. It is indicated that the validity of the formula may be formally generalized also to other quadrics of rotation.

IVAN HLAVÁČEK, Praha: *On Reissner's variational theorem for boundary-values in linear elasticity.* Apl. mat. 16 (1971), 109—124. (Original paper.)

E. Reissner suggested a variational theorem for the theory of elasticity, related closely to the well-known Trefftz method. In the present paper, the Reissner's theorem is discussed within the range of linear anisotropic and non-homogeneous elasticity. For the traction boundary-value problem, the minimal property of the functional and the convergence of any minimizing sequence are proved. For the displacement boundary-value problem and some mixed problems, it is shown that a modification is necessary. Then, in case of the displacement problem, the maximal property of the functional on the modified class of admissible functions and the convergence of maximizing sequence are proved.

DAGMAR GOGOVÁ, Bratislava: *Extrapolation method for numerical calculation of the derivative of the analytical function and its error estimate.* Apl. mat. 16 (1971), 125—135. (Original paper.)

In the paper a numerical method of calculation of the derivative is described. Error coefficients are tabulated and their application is shown on some examples.

IVAN HLAVÁČEK, Praha: *On the existence and uniqueness of solution of the Cauchy problem for a class of linear integro-differential equations.* Apl. mat. 16 (1971), 136–154. (Original paper.)

Some problems in the theory of viscoelasticity may be described by means of integro-differential equations. In the paper a class of initial-value problems is considered which includes these physical examples, covering also their analogues — equations of the second order in time coordinate. The theory is restricted to the equations only, possessing in the same term both the highest spatial and the highest time derivatives.

The weak solution is defined on the base of variational principles, introduced in a previous article, and its existence, uniqueness and continuous dependence on the given data is proved, using the theory of integral Volterra's equations in Banach spaces.