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Nets satisfying the quadrangle condition [Abstract of thesis]

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of L. Bican (Czech. Math. J. 25(100),1975, 71-75) it was shown that the group G of a finite rank is a Butler group, if and only if there exists a decomposition $\pi = \pi_1 \cup \pi_2 \cup \ldots \cup \pi_n$ of the set of all primes π such that $G \otimes Z_{\pi_j}$ is completely decomposable with ordered type set $T(G \otimes Z_{\pi_j})$ for all $j \in \{1,2,\ldots,n\}$. Thus it is natural to investigate the class $\mathfrak{M}$ of all torsionfree groups G of arbitrary rank, having the following property: there exists a decomposition $\pi = \pi_1 \cup \pi_2 \cup \ldots \cup \pi_n$ such that $G \otimes Z_{\pi_j}$ is completely decomposable group with ordered type set $T(G \otimes Z_{\pi_j})$ for all $j \in \{1,2,\ldots,n\}$.

The question whether the class $\mathfrak{M}$ is closed under pure subgroups is solved negatively.

In the second part of the presented work some necessary and sufficient conditions are given, under which every pure subgroup S of a group $G \in \mathfrak{M}$ lies in $\mathfrak{M}$. With respect to the definition of the class $\mathfrak{M}$, this means that there is a decomposition of the set π having the above properties. Concerning the length of this decomposition, an estimation in Theorem 3 is given, depending on the type (n, ℓ) of G, only. At the end of the second part it is shown that this estimation cannot be improved.

The third paragraph is devoted to the study of the closedness of the class $\mathfrak{M}$ with respect to regular subgroups. The group G_5 from Example 5 has the property that all its pure subgroups are in $\mathfrak{M}$; but this is not true for all regular subgroups of G_5. The main result of the third paragraph is Theorem 7 which gives some necessary and sufficient conditions under which every regular subgroup of a group $G \in \mathfrak{M}$ belongs to $\mathfrak{M}$.

NETS SATISFYING THE QUADRANGLE CONDITION

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In the present work nets satisfying the following condition of closedness of quadrangle are investigated: If any four points of a net no three of them lying on a line can be joined by five lines, there exists uniquely defined sixth line which also joins these points. The nets satisfying such a condition are called Q-nets. The work consists of four parts. The first part contains basic definitions and theorems. In the second part it is proved that every Q-net is an Ostrom net and every Ostrom net is a Q-net. In the third part there are studied some stronger closedness conditions which follow from the quadrangle condition, such that some parallelism of sides or some sides and diagonals are needed. In the fourth part it is proved that any Ostrom net over a Galois field can be embedded into a desarguesian plane. Further a classification of quadrangles in Ostrom net and a formula for number of such quadrangles are presented.

NUMERICAL SOLUTION OF CASCADE FLOWS BY FINITE ELEMENT METHOD

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The thesis is devoted to the mathematical and numerical study of a quasistationary, incompressible or subsonic compressible, irrotational, non-viscous cascade flows in a layer of variable thickness. It represents the gene-