

672-571. JOHAN H. B. KEMPERMAN and DONALD GIROD, University of Rochester, Rochester, New York 14627. On general solutions of the functional equation $\sum_{j=0}^n a_j f(x + T_j y) = 0$. Preliminary report.

Let K be a field of characteristic 0, and let X, Y be torsion-free Abelian groups. For $j = 0, \dots, n$ let $T_j: Y \rightarrow X$ be given homomorphisms, and let a_0, \dots, a_n be elements of K . Let $\Phi = \{f: X \rightarrow K \mid \sum_{j=0}^n a_j f(x + T_j y) = 0 \forall x \in X, y \in Y\}$. Let X' be a subgroup of X and let $\sigma: X \rightarrow X/X'$ be the canonical map. We say X' is a collapsing subgroup for the above equation if $\sum_{j=0}^n \sigma \circ T_j = 0$ for $\delta = \sigma \circ T_0, \dots, \sigma \circ T_n$. Let $\Sigma = \{X' \mid X' \text{ is a collapsing subgroup of } X\}$, and let $H = \bigcap \Sigma$. For $h \in X, g: X \rightarrow K$ define the function $(\Delta_h^m g)(x) = \sum_{i=0}^m (-1)^{m-i} g(x + ih)$, and let $\Phi_q = \{g: X \rightarrow K \mid \Delta_h^q g = 0 \text{ for all } h \in X\}$. The structure of Φ_q is well-known. Theorem. For all $f \in \Phi$ and for all $h \in H, \Delta_h^q f = 0$ if $q \geq 2^{n-1}$. If $h \notin H$, there exists $f \in \Phi$ such that $\Delta_h^m f \neq 0$ for any positive integer m . If $H = X$, then $\Phi \subseteq \Phi_{2^{n-1}}$. (Received November 5, 1969.)

672-572. GUENTER GRAUMANN, University of Florida, Gainesville, Florida 32601. The imbedding of special incidence structures. Preliminary report.

Following the construction of geometries by reflections we search for the imbedding of "group spaces" of a generalized euclidean and noneuclidean geometry without resources of group theory. We only presuppose the significant points of the group spaces. We mention that in the non-plane case we can prove a certain form of the desargues theorem in generalization of H. Karzel's proof ("Metrische Geometrie," Hamburg, 1963). Also we mention that our desarguesian plane geometry can be projectively closed by a method of E. Ellers and E. Sperner ("Einbettung eines desarguesschen Ebenenkeimes in eine projektive Ebene," Math. Sem. Univ. Hamburg. 25 (1961/62), 206-230). We now presuppose one more axiom for the nonplane geometry. We first then look at the bundle of all lines and all planes through a fixed point. This bundle satisfies the axioms of our plane geometry. Thus we can projectively close it. By doing this for each point we get new elements, so called ideal planes. We show then that there exists exactly one ideal plane which contains three given noncollinear points. Also we give an isomorphism (onto) between any projectively closed plane and a projectively closed bundle geometry. At the end we demonstrate how to construct coordinates by using the well-known methods with our results. (Received November 5, 1969.)

672-573. STEPHEN D. COMER, Vanderbilt University, Nashville, Tennessee 37203. The dual space of an algebra of formulas.

Suppose L is a first order language. For an L -theory Γ let $X(\Gamma)$ denote the set of all complete and consistent L -theories extending Γ , let F_Γ denote the LCA_ω algebra of L -formulas associated with the theory Γ and let $S(\Gamma)$ be the disjoint union of $\{F_\Delta : \Delta \in X(\Gamma)\}$. By the dual space of a CA_α A we mean the unique (up to isomorphism) reduced sheaf corresponding to A under the dual equivalence between the category of CA_α 's and the category of reduced sheaves of CA_α 's announced in Abstract 664-96, these *Notices* 15 (1969), 529. Theorem. There exist natural topologies on $X(\Gamma)$ and $S(\Gamma)$ so that $(X(\Gamma), S(\Gamma))$ is the dual space of F_Γ . Corollary. For an L -theory $\Gamma, F_\Gamma \cong \Gamma(X(\Gamma), S(\Gamma))$, the algebra of all continuous sections of $(X(\Gamma), S(\Gamma))$. (Received November 5, 1969.)