thermal character. In the real domain, there are three types: (I) and (II) $X+iY=F(x\pm iy,\ p\mp iq)$, $\Theta=a\theta+h$, where h is a biharmonic function; and (III) $X=\phi$, $Y=\psi$, $\Theta=h(X,\ Y)$, where ϕ and ψ are arbitrary functions, and h is a harmonic function of $(X,\ Y)$. Within the group of contact field element transformations, there are seven types. In the real domain there are five types: (I) and (II) The Kasner extended group; (III) and (IV) $p-iq=F(X\pm iY,\ x+iy)$, $\Theta=a[\theta-2\int(pdx+qdy)]+h(X,\ Y)$; and (V) $X=\phi$, $Y=\psi$, $\Theta=h(X,\ Y)$. Special cases are that the isogonal, the multiplicative, and the isocline trajectories of an isothermal family are always isothermal. (Received December 4, 1941.)

132. Edward Kasner and Don Mittleman: *A general theorem on the initial curvatures of dynamical trajectories.*

The theorem proved is an extension of Kasner's dynamical theorem which states that: If a particle starts from rest in any positional field of force, the initial curvature of the trajectory is one-third of the curvature of the line of force through the initial position. The generalized result is: If a particle starts from maximum rest in an acceleration field of order n, the initial curvature of the trajectory is $n!(n-1)!/(2n-1)!$ of the curvature of the line of force through the initial position. This paper will appear in the Proceedings of the National Academy of Sciences. (Received January 19, 1942.)

133. W. H. Roever: *Geometric statement of a fundamental theorem for four-dimensional orthographic axonometry.*

The theorem stated below makes possible the construction of three-dimensional models for the "picturization" of four-dimensional space in a manner analogous to that furnished by three-dimensional orthographic axonometry for the picturization of three-dimensional space on the plane. Theorem: Three conjugate diameters and the axis of revolution of an oblate spheroid may be regarded, as far as directions are concerned, as the orthographic projection on the three-dimensional space, in which the spheroid lies, of four mutually perpendicular concurrent axes of four-dimensional space. If these axes be taken as rectangular cartesian axes and the three-dimensional space of the spheroid as the picture space, then the ratios which the halves of the chosen conjugate diameters and the radius of the spheroid's focal circle bear to the spheroid's equatorial radius are the foreshortening ratios, that is, the numbers by which the scales on the axes of the four-dimensional space must be multiplied respectively in order to obtain those on the axonometric axes (that is, the three conjugate diameters and the axis of revolution of the given spheroid). (Received December 8, 1941.)

Logic and Foundations

134. A. R. Schweitzer: *On a class of ordered $(n+1)$-ads relevant to the algebra of logic.* I.

Within the frame of his geometric theory (American Journal of Mathematics, vol. 31, (1909), pp. 365–410, chap. 2, 3) the author generates complete classes of ordered $(n+1)$-ads $(n=1, 2, 3, \cdots)$ of generalized type of constituents in the algebra of logic by means of two equivalent processes: (1) Relatively to the given ordered $(n+1)$-ad $\alpha_1\alpha_2\cdots\alpha_{n+1}$ and the ordered dyads $(\alpha_1\lambda_1), \cdots, (\alpha_{n+1}\lambda_{n+1})$ the α's are replaced by the corresponding λ's either singly or in combination yielding $2^{n+1}(n+1)$-ads. (2) Relatively to α_1, λ_1 the elements $\alpha_2\alpha_3\cdots\alpha_{n+1}$; $\lambda_2\lambda_3\cdots\lambda_{n+1}$ are successively adjoined at the right (left) yielding the complete sets ($\alpha_1\alpha_2$; $\lambda_1\alpha_2$; $\alpha_1\lambda_2$, $\lambda_1\lambda_2$), and so on. It is then assumed that the preceding $(n+1)$-ads belong to the general abstract space $S_{n+1}(G, H)$ as defined by the author (abstract 46-9-438). When $G=H=$alternating (symmetric) group on $n+1$ variables, the α_i and λ_i are represented graphically as opposite vertices of regular polyhedra in euclidean $(n+1)$-space or opposite faces of duals of the latter. When $n=2$ the polyhedra are the octahedron and the cube. (Received January 30, 1942.)

135. A. R. Schweitzer: *On a class of ordered $(n+1)$-ads relevant to the algebra of logic.* II.

The author develops a finite algebra of logic in which the complete set of ordered $(n+1)$-ads of generalized constituent type relative to $\alpha_1\alpha_2 \cdots \alpha_{n+1}$ and the ordered dyads $(\alpha_1\lambda_1), \cdots, (\alpha_{n+1}\lambda_{n+1})$ is expressed as a reflexive formal sum: $\sum(\alpha_1\alpha_2 \cdots \alpha_{n+1}) = \sum(I)$. The corresponding terms are $\sum(\mathrm{A}_1\alpha_2 \cdots \alpha_{n+1})$, $\sum(\alpha_1\mathrm{A}_2 \cdots \alpha_{n+1}), \cdots$, $\sum(\Lambda_1\ \alpha_2 \cdots \alpha_{n+1}), \cdots, \sum(\alpha_1\alpha_2 \cdots \Lambda_{n+1})$, where $\sum(\mathrm{A}_1\alpha_2 \cdots \alpha_{n+1})$ is the sum of all $(n+1)$-ads containing α_1, and so on. Then for $n=2$, for example, $\alpha_1\alpha_2\alpha_3 = \sum(\mathrm{A}_1\mathrm{A}_2\mathrm{A}_3) = \sum(\mathrm{A}_1\alpha_2\alpha_3)\times(\alpha_1\mathrm{A}_2\alpha_3)\times\sum(\alpha_1\alpha_2\mathrm{A}_3)$, and so on. Also, $\sum(\mathrm{A}_1\alpha_2\alpha_3)+\sum(\Lambda_1\alpha_2\alpha_3) = \sum(\alpha_1\alpha_2\alpha_3)$, and so on. Finally it is assumed that the preceding $(n+1)$-ads belong to the abstract relational space $S_{n+1}(G, G)$, where G is an arbitrary substitution group on $n+1$ variables (including the identical group). When G is the symmetric group the symbol $\sum(\mathrm{A}_1\alpha_2 \cdots \alpha_{n+1})$ can be replaced by the more economical symbol $\sum(\mathrm{A}_1)$, and so on, and this case reduces essentially to a previous development by the author (abstract 47-9-430). (Received January 30, 1942.)

Statistics and Probability

136. Irving Kaplansky: *Note on a common error concerning kurtosis.*

In many text books there is to be found a statement to the effect that a frequency curve with positive (negative) kurtosis falls above (below) the corresponding normal curve in the neighborhood of the mean. In this note examples are given to show that there is actually no such connection between kurtosis and the height of the curve at its mean. (Received January 19, 1942.)

Topology

137. Paul Civin: *Two-to-one mappings of three-dimensional sets.*

This paper is concerned with the proof of the non-existence of a continuous mapping defined on the closed three-cell in which each inverse image consists of exactly two points. Corresponding theorems for the arc and two-cell were proved by O. G. Harrold (*The non-existence of a certain type of continuous transformation*, Duke Mathematical Journal, vol. 5 (1939), pp. 789–793) and J. H. Roberts (*Two-to-one transformations*, Duke Mathematical Journal, vol. 6 (1940), pp. 256–262), respectively. (Received January 26, 1942.)

138. F. B. Jones: *A certain non-metric Moore space.*

The purpose of this paper is to give an example of a non-metric Moore space which is nevertheless the sum of a monotone increasing collection of completely separable