Two variants of poker.


This is a supplement to “The theory of games...” [2nd ed., Princeton, 1947; MR0021298] pp. 186–219 (as promised in a footnote on page 196). It was prepared by D. Gillies (part II) and J. P. Mayberry (part I) from notes of von Neumann, with his advice and collaboration. All good strategies of the game (with bets of two sizes) formulated on pp. 190–191 of the reference are given in part I. Several different cases of classes of good strategies are noted depending on the relationship between the number of possible hands and the ratio of the high bet to the low bet. As the number of hands becomes infinite the good strategies of discrete hand-poker converge to those of the continuous hand-poker in the sense of weak convergence only. In part II, a version of poker, formulated on pp. 209–211 of the reference, is presented. This involves a continuum of hands, does not permit seeing, but does permit of multiplicity of bets, either the closed continuum between positive $a$ and $b$ or a discrete set in the same interval. In the continuous version the expected value for a good strategy is essentially independent of the hand. In the discrete version the impossibility of vanishingly cheap overbids against a given bid leads to a complicated fine structure. The relation between the strategies in the discrete and continuous games are discussed. Recent discussions of poker have appeared by Bellman and Blackwell [Proc. Nat. Acad. Sci. U. S. A. 35, 600–605 (1949); MR0031700], Kuhn [same Contributions, vol. 1, Princeton, 1950, pp. 97–103; MR0039222], and Nash and Shapley [ibid., pp. 105–116; MR0039223].

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