nacci series 0, 1, 1, 2, 3, 5, 8, 13, $\cdots$ giving the values of the Lucas function U_n associated with the polynomial x^2-x-1. This polynomial is irreducible modulo 13, so that the period of the Fibonacci series modulo 13 gives the period of the mark α associated with x^2-x-1 in the finite field of order 13^2. We have $\omega=7$, norm $\alpha=-1$, $\theta=2$, $k=2$, $\sigma=2$, $p-1=12$. Hence (2) becomes $(2, 2) \mid \delta \mid (2, 12)$, so that $\delta=2$. Hence the period is 28, which is easily verified directly. It seems quite difficult to determine the exact value of δ in all cases.*

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ON A PROBLEM OF KNASTER AND ZARANKIEWICZ†

BY J. H. ROBERTS

Knaster and Zarankiewicz have proposed the following problem:‡ "Does every continuum A contain a subcontinuum B such that $A-B$ is connected?" Knaster has shown,§ by an example in 3-space, that the answer is in the negative. In the present paper an example is given of a *plane* continuum M such that every non-degenerate proper subcontinuum of M disconnects M.

The point sets considered in this paper all lie in a plane.

DEFINITION OF $F(C; X, Y; \epsilon)$. Let C be any simple closed curve, X and Y distinct points of C, and ϵ any positive number. There exists a finite set of points $A_1, A_2, \cdots, A_n$, $(n>2)$, such that (a) $A_1+A_2+\cdots+A_n$ contains $X+Y$, (b) $A_1, A_2, \cdots, A_n$ lie on C in the order $A_1A_2\cdots A_nA_1$, and (c) A_i and A_{i+1} (subscripts are to be reduced modulo n) are the end points of an arc t_i of diameter $<\epsilon$ which is a subset of C not containing A_{i+2}. There exists a set of mutually exclusive arc segments $v_1, v_2, \cdots, v_n$ lying within C such that v_i+t_i is a simple closed curve w_i of diameter $<\epsilon$. Let J denote the simple closed curve

* See the discussion at the close of my paper, Transactions of this Society, vol. 33 (1931), p. 165.

† Presented to the Society, December 1, 1933.

‡ Fundamenta Mathematicae, vol. 8 (1926), Problem 42, p. 376.

§ B. Knaster, *Sur un continu que tout sous-continu divise*, Proceedings of the Polish Mathematical Congress, 1929, p. 59.