tains the connected set $W-W\times C'$. But since we also know that $M=W'=(W-W\times C')'+C'$, $(W-W\times C')'=M$ and so Z_1 contains Z_2, which is impossible. Therefore $W-C$ is connected and so W is the sum of two mutually exclusive connected subsets, which is a contradiction. Hence W must be widely connected.

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QUADRILATERALS INSCRIBED AND CIRCUMSCRIBED TO A PLANE CUBIC*

BY A. H. DIAMOND

In a paper by M. W. Haskell† the geometrical configurations of triangles inscribing and circumscribing a plane cubic curve have been studied by analytic methods. The purpose of this paper is to examine the properties of quadrilaterals inscribing and circumscribing a plane cubic curve by means of elliptic functions.

The coordinates of a point on the curve will be expressed in terms of Weierstrass' elliptic functions $\wp(u)$ and $\wp'(u)$. It is known that $3n$ points of the cubic are the points of intersection of the cubic with a curve of order n if‡

$$(1) \qquad u_1+u_2+\cdots+u_{3n}\equiv 0 \mod (\omega_1, \omega_2).$$

The values of the parameters of the vertices of the quadrilaterals are obtained from a consideration of the congruences

$$2u_1+u_2\equiv 0,\quad 2u_2+u_3\equiv 0,\quad 2u_3+u_4\equiv 0,\quad 2u_4+u_1\equiv 0,$$

whence

$$15u_1\equiv 0,$$

or

$$u_1=\frac{k_1\omega_1+k_2\omega_2}{15},$$

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* Presented to the Society, November 29, 1930.

† Haskell, this Bulletin, vol. 25 (1918), p. 194.

‡ Appell and Lacour, *Théorie des Fonctions Elliptiques et Applications*, Chap. 3.