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ON SOME RESULTS ON THETA CONSTANTS (I).

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Dedicated to Professor Katuzi Ono on his 60th birtbday

D. Mumford has shown an excelent algebralization of theory of theta constants and theta functions in his papers: On the equations defining abelian varieties I, II, III (Invent. Math. 1. 237–354 (1966), 3. 75–135 (1967), 3. 215–244) (1967). Our starting point and idea, however, are something different from those of Mumford; we begin our study at characterizing abelian addition formulae among all the possible addition formulae, and we want to give expressions to everything in words of matric notations.

§ 1. Commutative composition and 2-division points.

We mean by K the universal domain and by $ch(K)$ the characteristic of K. For each finite additive group G we associate a system of indeterminates X_a $(a \in G)$ and the projective space P_G with the homogeneous coordinate ring $K[(X_a)_{a\in G}]$.

In the following we shall assume that the order $|G|$ of G is always odd and shall use the following notation for brevity;

Point in P_G	Homogeneous coordinates	The a-component
x	$(x_a)_{a\in G}$	x_a
x^{-1}	$(x_{-a})_{a\in G}$	x_{-a}
$x(b)$	$(x_{a+b})_{a\in G}$	x_{a+b}
Matrix	**The (a, b)-component**	
$(x_{-a+b}y_{a+b})_{a\in G,\, b\in G}$	$x_{-a+b}y_{a+b}$	
${}^t(x_{-a+b}y_{a+b})_{a\in G,\, b\in G}$	$x_{-b+a}y_{b+a}$	

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