

## CERTAIN PROPERTIES OF JACOBI'S THETA FUNCTIONS

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**Abstract:** In this paper, certain properties of Jacobi's theta functions have been discussed.

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### 1. Introduction, Notations and Definitions

For complex variables  $a$  and  $q$  with  $|q| < 1$ , the  $q$ -shifted factorials are given by

$$(a; q)_0 = 1, (a; q)_n = \prod_{r=0}^{n-1} (1 - aq^r), (a; q)_\infty = \lim_{n \rightarrow \infty} (a; q)_n$$

and for brevity, let

$$(a_1, a_2, \dots, a_r; q)_n = (a_1; q)_n (a_2; q)_n \dots (a_r; q)_n.$$