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ON CERTAIN PRODUCT FORMULAS FOR BASIC HYPERGEOMETRIC FUNCTIONS

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Abstract: In this paper, making use of certain known summation formulas and modified Bailey transform, we have established product formulas for basic hypergeometric functions.

Keywords and Phrases: Summation formula, transformation formula, product formulas, basic hypergeometric function, Bailey transform.

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1. Introduction, Notations and Definitions

The widely-investigated transform, which was discovered by Bailey in 1947, has been used by Bailey [2,3], Slater [7], Andrwes [1], Srivastava, Singh, Singh and Yadav [6], Verma [9], Denis, Singh and Singh [4] and many others to obtain transformations of q-series and also q-series identities. In the present paper, we have used the Bailey transform to obtain product formulas of basic hypergeometric functions.

In this paper, we shall adopt following notations and definitions. The q-rising factorial is defined (for $|q| < 1$) by

$$(a;q)_0 = 1 \qquad \text{and} \qquad (a;q)_n = (1-a)(1-aq)\cdots(1-aq^{n-1}) \qquad (n = 1, 2, 3, \cdots).$$

We also write

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