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# A note on certain transformations involving Lambert series

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**Abstract:** In this paper, making use of known summation formula [1] for bilateral basic hypergeometric series [5], an attempt has been made to established certain interesting results involving Lambert series [1] and continued fractions in q-series [5].

**Key words and phrases:** Bilateral basic hypergeometric series, q-series, Lambert series, Continued fractions.
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## 1. Introduction, Notations and Definitions

For real or complex $q$, $|q| < 1$, the $q$ -shifted factorial is defined by

$$(a,q)_n = \begin{cases} 1 & \text{if } n = 0; \\ (1-a)(1-aq)(1-aq^2)\ldots,(1-aq^{n-1}) & \text{if } n \in N. \end{cases} \tag{1.1}$$

$$[a;q]_\infty = \prod_{r=0}^{\infty}(1-aq^r) \tag{1.2}$$

and

$$[a_1, a_2, \ldots, a_r; q]_n = \prod_{k=0}^{r}[a_k; q]_n \tag{1.3}$$

The Roger-Ramanujan's continued fraction is given by

$$R(q) = \frac{q^{1/5}}{1+}\frac{q}{1+}\frac{q^2}{1+}\frac{q^3}{1+\cdots} \tag{1.4}$$

Using Rogers-Ramanujan identity, viz.

$$G(q) = \sum_{n=0}^{\infty}\frac{q^{n^2}}{[q;q]_n} = \frac{1}{[q;q^4;q^5]_\infty} \tag{1.5}$$