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On some identities of Rogers-Ramanujan type and continued fractions

Dr. Mohammad Shahjade and S. N. Singh*,
HOD, Department of Mathematics , MANUU, Poly. 8th Cross,
1st Stage, 3rd Block, NAGARBHAVI, BANGALORE -72.
Email Address: mohammadshahjade@gmail.com
*Department of Mathematics,
T.D.P.G. College, Jaunpur-222002 (U.P.) India.
E-mails; snsp39@gmail.com; snsp39@yahoo.com

Abstract: In this paper we have established certain results involving q-series identities and continued fractions.
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1. Introduction, Notations and Definitions

The q-rising factorial $(a;q)_k$ is defined as,

$$(a,q)_k = \begin{cases} 1 & \text{if } k=0; \\ (1-a)(1-aq)(1-aq^2)\ldots(1-aq^{k-1}) & \text{if } k \geq 1. \end{cases}$$

Similarly, the infinite q-rising factorial is defined by

$$(a;q)_\infty = \prod_{r=0}^{\infty}(1-aq^r), \quad \text{for } \ |q|<1.$$

The q-generalization of 1+1+1+1+...+1=n is

$$1+q+q^2+...+q^{n-1} = \frac{1-q^n}{1-q}.$$

Similarly, Ramanujan generalized the continued fraction

$$1+\frac{1}{1+}\frac{1}{1+}\frac{1}{1+...}$$

to

$$1+\frac{q}{1+}\frac{q^2}{1+}\frac{q^3}{1+...}$$