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SOME MATCHING COEFFICIENTS OF $q-$PRODUCTS

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Abstract: We find some results on matching coefficients for certain q-products. Some of the results are associated with Rogers−Ramanujan continued fraction

$$R(q) = \frac{(q, q^4; q^5)_\infty}{(q^2, q^3; q^5)_\infty},$$

while some are associated with analogous of Rogers−Ramanujan functions. The techniques used for proving the results involves Ramanujan's theta functions, identities for Rogers−Ramanujan type functions, and q-series manipulations.

Keywords and Phrases: Matching coefficient, q-product, Rogers−Ramanujan continued fraction, Rogers−Ramanujan type functions.

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1. Introduction

Recently, Baruah and Das [7] have found some interesting results on the series expansion of certain q-products having matching coefficients with their reciprocals. For example, consider

$$S_1(q) = \sum_{n=0}^{\infty} s_1(n) q^n,$$

and

$$\frac{1}{S_1(q)} = \sum_{n=0}^{\infty} s_1'(n) q^n.$$