SEA. Jour. Math. & Math.Sc.
Vol.1 No.1 (2002), pp.1-17

ON REDUCIBILITY OF CERTAIN q-DOUBLE HYPERGEOMETRIC SERIES AND CLAUSEN TYPE IDENTITIES

Remy Y. Denis
Dept. of Math.
Gorakhpur University
Gorakhpur-273009
India

S.N.Singh
Dept. of Math.
T.D.P.G. College
Jaunpur-222002
India

S.P.Singh
Dept. of Math.
T.D.P.G.College
Jaunpur-222002
India

(Received : October 8, 2002)

Abstract: In this paper, a method has been developed to establish certain transformations of double q-series in terms of basic hypergeometric functions of one variable. These results lead to certain interesting Clausen type identities. We also discuss certain continued fraction representations involving q-series.

Key words & Phrases: q-series, basic hypergeometric series, Clausen identities.

AMS Classification: 33A30.

1. Introduction:

In this paper, we have made use of certain known summations to establish transformations of q-double series in terms of a single series. We have deduced Clausen type identities from these results. We also discuss some interesting continued fraction representations involving q-series.

For α, real or complex and |q|<1, we define the q-shifted factorials by

$$[\alpha;q]_n = \begin{cases} 1 & \text{if } n = 0 \\ (1-\alpha)(1-\alpha q)...(1-\alpha q^{n-1}), & \text{if } n = 1,2,3,... \end{cases} \quad (1)$$

A basic hypergeometric function is defined as :