

INTEGRALS INVOLVING THE ALEPH-FUNCTION OF SEVERAL VARIABLES

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Abstract: In this paper, we evaluate four integrals involving the product of elementary special functions and the multivariable Aleph-function. The integrals are quite general in nature and from them a large number of new results can be obtained simply by specializing the parameters of the multivariable Aleph-function.

Keywords: Multivariable Aleph-function, Integral, multivariable H-function, Aleph-function of two variables, I-function of two variables.

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1. Introduction and Preliminaries

The multivariable Aleph-function is an extension of the multivariable I-function recently defined by C.K. Sharma and Ahmad [8], itself is a generalization of the multivariable H-function defined by Srivastava et al [10,11]. The multivariable Aleph-function is defined by means of the multiple contour integral :

We have,

$$\begin{aligned} \aleph(z_1, \dots, z_r) &= \aleph_{p_i, q_i, \tau_i; R: p_{i(1)}, q_{i(1)}, \tau_{i(1)}; R^{(1)}; \dots; p_{i(r)}, q_{i(r)}, \tau_{i(r)}; R^{(r)}}^{0, n: m_1, n_1, \dots, m_r, n_r} \\ &\left(\begin{array}{c} z_1 \\ \cdot \\ \cdot \\ \cdot \\ z_r \end{array} \middle| \begin{array}{l} [(a_j; \alpha_j^{(1)}, \dots, \alpha_j^{(r)})_{1,n}], [\tau_i(a_{ji}; \alpha_{ji}^{(1)}, \dots, \alpha_{ji}^{(r)})_{n+1, p_i}] : [(c_j^{(1)}, \gamma_j^{(1)})_{1, n_1}], \\ \dots\dots\dots [\tau_i(b_{ji}; \beta_{ji}^{(1)}, \dots, \beta_{ji}^{(r)})_{m+1, q_i}] : [(d_j^{(1)}, \delta_j^{(1)})_{1, m_1}], \\ [\tau_{i(1)}(c_{ji(1)}^{(1)}, \gamma_{ji(1)}^{(1)})_{n_1+1, p_i^{(1)}}]; \dots; [(c_j^{(r)}, \gamma_j^{(r)})_{1, n_r}], [\tau_{i(r)}(c_{ji(r)}^{(r)}, \gamma_{ji(r)}^{(r)})_{n_r+1, p_i^{(r)}}] \\ [\tau_{i(1)}(d_{ji(1)}^{(1)}, \delta_{ji(1)}^{(1)})_{m_1+1, q_i^{(1)}}]; \dots; [(d_j^{(r)}, \delta_j^{(r)})_{1, m_r}], [\tau_{i(r)}(d_{ji(r)}^{(r)}, \delta_{ji(r)}^{(r)})_{m_r+1, q_i^{(r)}}] \end{array} \right) \\ &= \frac{1}{(2\pi\omega)^r} \int_{L_1} \dots \int_{L_r} \psi(s_1, \dots, s_r) \prod_{k=1}^r \phi_k(s_k) z_k^{s_k} ds_1 \dots ds_r \end{aligned} \quad (1.1)$$