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SOME KEY PROPERTIES OF THE GENERALISED TRIPLE HYPERGEOMETRIC FUNCTION OF SRIVASTAVA'S

$$H_{A,p,\upsilon}(w_1, w_2, w_3; w_4, w_5; z_1, z_2, z)$$

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Abstract. With the help of the generalised Beta function $B_{p,\upsilon}(x,y)$, we are able to create a generalised version of Srivastava's triple hypergeometric function $H_A(\cdot)$ associated with a numerical approaximation table in this paper, along with its integral expressions. Furthermore, we list some of its key properties, including the Mellin transform, a partial derivative identity, recurrence relations, and a bounded inequality . We also provide some integral expressions of this generalised $H_{A,p,\upsilon}(\cdot)$ function that use Meijers's G-function, the product of the Macdonald and Gauss hypergeometric functions. In addition, we compute a numerical approximation table of this generalised hypergeometric function $H_{A,p,\upsilon}(\cdot)$ with bounds by Wolfram Mathematica and computer algebraic software or objected oriented programme.

1. Introduction, definitions and preliminaries

Many areas of mathematical physics, statistics, economics, and other disciplines have a long history of using hypergeometric functions of a single variable. For the value of $w_1, w_2 \in \mathbf{C}$, $w_3 \in \mathbf{C}\backslash\mathbf{Z}_0^-$, the Gauss hypergeometric function is defined by [17]

$$_2F_1\left(\begin{array}{c} w_1, w_2 \\ w_3 \end{array}; z\right) = \sum_{n=0}^{\infty} \frac{(w_1)_n(w_2)_n}{(w_3)_n} \frac{z^n}{n!} \qquad (|z| < 1). \tag{1.1}$$

This hypergeometric function extensions includes w_j $(1 \le j \le p, q)$, which also has so many wide application; see [23].

The literature that is currently available on hypergeometric series includes this series and its generalisations in a number of application-related branches of mathematics.