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A GENERALIZED FORMULA INVOLVING GAMMA FUNCTION

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Abstract: In this paper, we have developed the generalized expression

$$_{2}F_{1}\left[\begin{array}{ccc}a,b&;&1\\\frac{a+b+n}{2}&;&2\end{array}\right]$$

and some formulae of this generalized formula.

Keywords and Phrases: Pochhammer symbol, Digamma function, Hypergeometric function, Gauss, Positive integers.

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1. Introduction

Appell's Hypergeometric Function $F_1(x, y), F_2(x, y), F_3(x, y), F_4(x, y)$ are defined as (see [6]):

$$F_1[a;b,c;d;x,y] = \sum_{m=0}^{\infty} \sum_{n=0}^{\infty} \frac{(a)_{m+n}(b)_m(c)_n x^m y^n}{(d)_{m+n} m! n!}, \quad \max\{|x|,|y|\} < 1 \quad (1.1)$$

$$F_2[a;b,c;d,e;x,y] = \sum_{m=0}^{\infty} \sum_{n=0}^{\infty} \frac{(a)_{m+n}(b)_m(c)_n x^m y^n}{(d)_m(e)_n m! n!}, \quad |x| + |y| < 1$$
 (1.2)

$$F_3[a,b;c,d;e;x,y] = \sum_{m=0}^{\infty} \sum_{n=0}^{\infty} \frac{(a)_m(b)_n(c)_m(d)_n x^m y^n}{(e)_{m+n} m! n!}, \quad \max\{|x|,|y|\} < 1 \quad (1.3)$$