A GENERALIZED FORMULA INVOLVING GAMMA FUNCTION

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

$$
{}_2F_1 \left[\begin{array}{ccc} a,\ b & ; & 1 \\ \frac{a+b+n}{2} & ; & 2 \end{array} \right]
$$

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]):

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

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

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