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SOME TRANSFORMATIONS FOR GOURSAT'S FUNCTION ${}_2F_2[2z]$

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Abstract: The objective of this paper is to obtain six new explicit forms of quadratic transformations for Goursat's hypergeometric function ${}_2F_2[a, m+d; 2a \pm j, d; 2z]$ with suitable convergence conditions.

Keywords and Phrases: Kummer's first and second transformations, Kummer's confluent hypergeometric function, Goursat's hypergeometric function.

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1. Introduction and Preliminaries

In our present investigation, we shall make use of the following standard notations:
$\mathbb{N} := \{1, 2, 3, \cdots\}$; $\mathbb{N}_0 := \mathbb{N} \bigcup \{0\}$; $\mathbb{Z}_0^- := \mathbb{Z}^- \bigcup \{0\} = \{0, -1, -2, -3, \cdots\}$.
Also as usual, the symbols $\mathbb{C}$, $\mathbb{R}$, $\mathbb{N}$, $\mathbb{Z}$, $\mathbb{R}^+$ and $\mathbb{R}^-$ denote the sets of complex numbers, real numbers, natural numbers, integers, positive and negative real numbers, respectively.
The Pochhammer's symbol (or the shifted factorial) $(\alpha)_p$ $(\alpha, p \in \mathbb{C})$ is defined by

In loving memory of Prof. R. Y. Denis (DDU University, Gorakhpur, U.P.), this paper is dedicated.