HYPERGEOMETRIC FORMS OF SOME FUNCTIONS INVOLVING ARCSINE(x) USING DIFFERENTIAL EQUATION APPROACH

M. I. Qureshi, Shakir Hussain Malik and Tafaz ul Rahman Shah

Department of Applied Sciences and Humanities,
Faculty of Engineering and Technology
Jamia Millia Islamia (A Central University), New Delhi - 110025, INDIA

E-mail : miqureshi_delhi@yahoo.co.in, malikshakir774@gmail.com,
tafazuldiv@gmail.com

Abstract: In this paper, by changing the independent and dependent variables in the suitable ordinary differential equations of second and third order and comparing the resulting ordinary differential equations with standard ordinary hypergeometric differential equations of Gauss and Clausen, we obtain the hypergeometric forms of following functions:

$$\frac{\sin^{-1}(x)}{\sqrt{(1-x^2)}}, \quad [\sin^{-1}(x)]^2 \quad and \quad \sin^{-1}(x).$$

Keywords and Phrases: Hypergeometric functions, Ordinary differential equations.

2010 Mathematics Subject Classification: 33C20, 34-XX.

1. Introduction and Preliminaries

In our investigations, we shall use the following standard notations:
$\mathbb{N} := \{1, 2, 3, \cdots\}; \mathbb{N}_0 := \mathbb{N} \bigcup \{0\}; \mathbb{Z}_0^- := \mathbb{Z}^- \bigcup \{0\} = \{0, -1, -2, -3, \cdots\}.$
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.