

Estimating the polygamma functions for negative integers

Abstract

The polygamma functions $\psi(r)(x)$ are defined for all $x>0$ and $r\in\mathbb{N}$. In this paper, the concepts of neutrix and neutrix limit are applied to generalize and redefine the polygamma functions $\psi(r)(x)$ for all $x\in\mathbb{R}$ and $r\in\mathbb{N}$. Also, further results are given.

Keyword: Gamma function; Neutrices; Neutrix limits; Polygamma functions.