NEW INEQUALITIES FOR SOME GENERALIZED MATHIEU TYPE SERIES AND THE RIEMANN ZETA FUNCTION

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Abstract. Our aim in this paper is to derive several new inequalities for the Mathieu type series and the Riemann zeta function. In particular, we prove Turán type inequalities and some monotonicity and log-convexity results for these special functions. New Laplace type integral representations for the Mathieu type series and the Riemann zeta function are also presented.


Keywords and phrases: Mathieu series, generalized Mathieu series, Riemann zeta function, inequalities, Bessel function, Mellin and Laplace integral representations, Turán type inequalities.

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