LANDEN INEQUALITIES FOR A CLASS OF
HYPERGEOMETRIC FUNCTIONS WITH APPLICATIONS

Miao-Kun Wang and Yu-Ming Chu

Abstract. In this paper, we study a class of Gaussian hypergeometric function $\_2F_1(a,b;(a+b+1)/2,x)$, and find the maximal regions of $ab$ plane in the first quadrant where the well-known Landen identities for the complete elliptic integrals of the first kind turn on respective inequalities valid for each $x \in (0,1)$. Besides, the generalized Grötzsch ring function with two parameters $\mu_{a,b}(r)$ is introduced, and the analogs of duplication formula satisfied by Grötzsch ring function $\mu(r)$ for $\mu_{a,b}(r)$, in the form of inequalities, will be derived.

Mathematics subject classification (2010): 33E05, 33C05.

Keywords and phrases: Hypergeometric function, complete elliptic integrals, generalized Grötzsch ring function, Landen inequalities, duplication formula.

REFERENCES


