

Abstract

Propositions about the nonexistence of complex zeros of the functions $H_\mu(z) = aJ_\mu(z) + zJ'_\mu(z)$, $J'_\mu(z)$, $J''_\mu(z)$, where $J'_\mu(z)$ and $J''_\mu(z)$ are the first two derivatives of the Bessel functions $J_\mu(z)$, for μ in general complex, are proved. Bounds for the purely imaginary zeros of the above functions assuming their existence are given. Thus for the range of values for which these bounds are violated there are no purely imaginary zeros of the above functions. Finally, some known results from previous work are generalized in the present paper.