Abstract

The present article is concerned with lower and upper bounds of the first poitive zero of the function $H_\nu(z, \alpha) = \alpha J_\nu(z) + z J_\nu'(z)$, where $J_\nu(z)$ is the ordinary Bessel function of order $\nu > -1$ and $J_{nu}'(z)$ is the derivative of $J_\nu(z)$. A lower bound here improves and extends the range of validity of order ν, of a lower bound found in [E. K. Ifantis and P. D. Siafarikas, Ordering relations between the zeros of miscellaneous Bessel functions, *Appl. Anal.* **23** (1986), 85-110]. Also, two upper bounds given here improve a previously known upper bound [E. K. Ifantis and P. D. Siafarikas, Ordering relations between the zeros of miscellaneous Bessel functions, *Appl. Anal.* **23** (1986), 85-110]. In the particular case $\alpha = 0$, these bounds lead to lower and upper bounds for the first positive zero $j_{\nu,1}'$ of $J_\nu'(z)$ which improve well-known bounds in the literature.