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Monotonicity Results for the Gamma Function

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Abstract:

The function $\frac{[\Gamma(x+1)]^{1/x}}{x+1}$ is strictly decreasing on $[1,\infty)$, the function $\frac{[\Gamma(x+1)]^{1/x}}{\sqrt{x}}$ is strictly increasing on $[2,\infty)$, and the function $\frac{[\Gamma(x+1)]^{1/x}}{\sqrt{x+1}}$ is strictly increasing on $[1,\infty)$, respectively. From these, some inequalities, for example, the Minc-Sathre inequality, are deduced, and two open problems posed by the second author are solved partially.

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