Volume 3, **Issue 5**, **Article 73**

A Monotonicity Property of the Gamma Function

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Abstract:

It is shown that the function $x \mapsto 1 + \frac{1}{x} \ln \Gamma(x+1) - \ln(x+1)$

is strictly completely monotone on $(-1, \infty)$ and tends to one as

$x \to -1$, to zero as $x \to \infty$. This property is derived from a suitable

integral representation of $\ln \Gamma(x+1)$.

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