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Arithmetic Functions of Fibonacci and Lucas Numbers,
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Abstract

Let F_n and L_n be the n th Fibonacci and Lucas numbers, respectively. Let $\varphi(n)$ be the Euler totient function of n and $\sigma_k(n)$ the sum of k th powers of the positive divisors of n . Luca obtained the inequalities $\varphi(F_n) \geq F_{\varphi(n)}$, $\sigma_0(F_n) \geq F_{\sigma_0(n)}$, and $\sigma_k(F_n) \leq F_{\sigma_k(n)}$ for all $n, k \geq 1$. In this article, we extend Luca's result by replacing the function φ by φ_k and J_k , which are generalizations of φ . We also consider the corresponding results for $\varphi_k(L_n)$, $L_{\varphi_k(n)}$, $J_k(L_n)$, $L_{J_k(n)}$, $\sigma_k(L_n)$, and $L_{\sigma_k(n)}$.