Kritkhajohn Onphaeng and Prapanpong Pongsriiam
Subsequences and Divisibility by Powers of the Fibonacci Numbers,
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Abstract

Let F_n be the nth Fibonacci number. Let m, n be positive integers. Define a sequence $(G(k,n,m))_{k\geq 1}$ by $G(1,n,m) = F_n^m$, and $G(k+1,n,m) = F_{nG(k,n,m)}$ for all $k \geq 1$. We show that $F_n^{k+m-1} \mid G(k,n,m)$ for all $k, m, n \in \mathbb{N}$. Then we calculate $\frac{G(k,n,m)}{F_n^{k+m-1}} \pmod{F_n}$.