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The Order of Appearance of Powers of Fibonacci and Lucas Numbers,
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Abstract

Let F_n be the n th Fibonacci number. The order of appearance $z(n)$ of a natural number n is defined as the smallest natural number k such that n divides F_k . For instance, $z(F_n) = n$, for all $n \geq 3$. In this paper, among other things, we prove that

$$z(F_n^{k+1}) = \frac{nF_n^k}{2},$$

for all integers $k \geq 2$ and $n > 3$ with $n \not\equiv 3 \pmod{6}$.