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The p-Adic Valuation of Lucas Sequences,
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Abstract

Let $(u_n)_{n\geq 0}$ be a nondegenerate Lucas sequence with characteristic polynomial $X^2 - aX - b$, for some relatively prime integers a and b. For each prime number p and each positive integer n, we give simple formulas for the p-adic valuation $\nu_p(u_n)$, in terms of $\nu_p(n)$ and the rank of apparition of p in $(u_n)_{n\geq 0}$. This generalizes a previous result of Lengyel on the p-adic valuation of Fibonacci numbers, and also the folkloristic "lifting-the-exponent lemma".