

Downey, Peter J.; Griswold, Ralph E.

On a family of nested recurrences. (English) Zbl 0547.10009
Fibonacci Q. 22, 310-317 (1984).

Let k be an integer and let $g_k(n)$ be a function defined by $g_k(n) = n - g_k(g_k(n - k))$ for integers $n \geq 1$ and $g_k(n) = 0$ for $n \leq 0$. The authors give a closed form for the numbers $g_k(n)$ proving that $g_k(n) = \sum_{i=0}^{k-1} [\psi[(n+i)/k] + \psi]$, where $\psi = (\sqrt{5}-1)/2$ and $[x]$ denotes the greatest integer function. In case $k = 1$ the following interesting result is proved: The set of positive integers n for which $g_1(n) - g_1(n-1) \neq 0$ is given by the set $B_\phi = \{[\phi], [2\phi], \dots\}$, where $\phi = \psi + 1$.

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MSC:

[11B39](#) Fibonacci and Lucas numbers and polynomials and generalizations
[11B37](#) Recurrences

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