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Abstract

Define the sequence $\{U_n\}$ as $U_0 = 0$, $U_1 = 1$, and $U_n = pU_{n-1} - U_{n-2}$ for $n \geq 2$. We study $\sum_{h=0}^{n} h^m \binom{n}{h} U_h$ and $\sum_{h=0}^{n} (-1)^{n+h} h^m \binom{n}{h} U_h$, and express them in terms of two associated sequences. Special cases of $p = 2, 3$ lead to interesting binomial and Fibonacci identities.