1035-11-309   **George W Grossman*** (`gross1gw@cmich.edu`), Department of Mathematics, Central Michigan University, Mount Pleasant, MI 48859, and **Zinyun Zhu** (`zhu1x@cmich.edu`), Department of Mathematics, Central Michigan University, Mount Pleasant, MI 48859. *Sum of powers of integers and binomial coefficients.*

We derive a linear, nonhomogeneous, recurrence relation having two indeces, that is, doubly-recurrent. We construct solutions which are rational expressions with indeterminate forms evaluated in a limit at a binomial coefficient.

The following problem is posed: express sums of the form $\sum_{i=1}^{n} i^p$, $p \in \mathbb{N}$, denoted $S_p(n)$, as a linear combination of binomial coefficients $(an + b)$ choose $(cn + d)$ for constants a, b, c, d and having integer coefficients independent of n, with the condition that at least one of the finite (increasing) sequences $\{an + b\}$ (over a, b) or similarly, $\{cn + d\}$ is strictly increasing. We offer solutions for $p = 2, 3$ and also derive an explicit nonhomogeneous recurrence relation satisfied by $S_p(n), p \geq 1$, based on Riemann sums. (Received August 31, 2007)

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