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Using generating functions find the sum

$$1^3 + 2^3 + 3^3 + \dots + n^3$$

Asked 6 years, 11 months ago Active 11 months ago Viewed 8k times



13

I am quite new to generating functions concept and I am really finding it difficult to know how to approach problems like this. I need to find the sum of $1^3 + 2^3 + 3^3 + \dots + n^3$ using generating functions. How do I proceed about it?



[discrete-mathematics](#)

[generating-functions](#)



12

edited Oct 8 '12 at 14:58



mdp

11.9k

1

29

57

asked Oct 8 '12 at 14:56



user1631009

95

1

7

- If you have a generating function $f(x)$ for a sequence a_n , then $xf'(x)$ gives a generating function for na_n . Can you produce a generating function for $a_k = k^3$ (for $k \leq n$) this way? – [Thomas Belulovich](#) Oct 8 '12 at 15:01

The other element of the puzzle: from the generating function for the sequence a_n , do you understand how to find the generating function for the sequence $b_n = \sum_{i \leq n} a_i$? (Hint: if $g(x) = \sum_n b_n x^n$, what is $xg(x)$? What is $xg(x) - g(x)$?) – [Steven Stadnicki](#) Oct 8 '12 at 15:46

7 Answers

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