ASYMPTOTICS FOR GENERATING FUNCTIONS :
A GUIDED TOUR

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Abstract

Many enumeration problems have complicated and indirect solutions in terms of generating functions. In contrast, the final counting results behing these generating functions usually have a fairly simple form when reduced to their asymptotic form.

We shall present a quick tour of the major techniques used to derive asymptotic estimates in combinatorial enumerations when starting from a generating function.

The methods that are largely based on complex analysis include singularity analysis, saddle point methods, Mellin transforms and some of the theory of functional or differential equations. In many cases where an expression for a generating function is known, the corresponding asymptotic probem can be solved by rather synthetic methods.