Algebraicity of Counting Functions

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In the context of counting the number of random walks in the quarter plane, we examine the question of whether the associated generating function is rational, algebraic, differentiably finite, or neither.

Our approach is one of algebraic combinatorics: we find a functional equation for the generating function and use this to derive a formal solution.

In this talk we shall present some pedagogical examples for generating functions belonging to either of the above mentioned cases.