

Methods of solving linear recurrences

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Recurrent sequences offer ways to solve effectively many problems that arise not only in multiple branches of mathematics but also in various other areas of knowledge. Their applications for the raising to a power of matrices, calculation of determinants, solving the Diophantine and functional equations, counting the polygons, determined by a network of straight lines in the plan etc. are well known. Recurrent sequences offer original ways to solve problems related to sound wave motion, bacterial culture establishment, chromatography, minimal time learning strategies etc. The beauty of recurrent sequences makes them an important chapter of Competitive Mathematics. Some methods of solving recurrent sequences, including the use of finite-difference methods to solve linear recurrent sequences of the first order with constant and variable coefficients and linear recurrent sequences of second and third order with constant coefficients, will be presented. Some problems, solved using the linear recurrent sequences methods will be presented too.