

The Harmonic Oscillator via The Discrete Path Approach

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Abstract

The discrete path approach has recently been used to obtain a closed form solution for two simultaneous difference equations with variable coefficients. We apply this result to the solution of the discretized harmonic oscillator and recover the well known traditional solutions. In the process we learn how the enumerative discrete path solution transforms into a more convenient compact analytic closed form. The discrete path approach is specially adapted to problems with mixed boundary conditions, and the techniques learned here will be useful in obtaining analytic solutions of anticipatory difference equations with mixed boundary conditions like those arising in the modeling of anticipatory systems.