

Asymptotic Solutions of Linear Difference Equations

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In this talk, we will study asymptotic solutions of linear difference equations with given initial conditions. We use ratio asymptotics and order reduction method to obtain asymptotic formulas in the outer region. Then, we introduce a matching principle to derive asymptotic results in the oscillatory region. Our methods can be applied in asymptotic problems related to hypergeometric orthogonal polynomials and continued fractions.