

Utilization of the circulant matrix theory in periodic higher order autonomous difference equations

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In this talk we develop easily verifiable tests that we can apply to determine whether or not a higher order autonomous difference equation has a p -periodic solution. One of the main tools in our investigations is a transformation, recently introduced by the authors, which formulates a given higher order difference equation as a first order recursion. The second important tool is the theory of circulant matrices. The periodicity conditions are formulated in terms of the coefficients of the higher order equation, along with examples showing that they have nontrivial applications.