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# Partial difference equations arising in numerical schemes and game theory

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## Abstract

A functional analytic method is used to prove that some linear and non-linear partial difference equations of two, three and four variables, which arise in numerical schemes and game theory, have a unique solution in the spaces  $l_{N_2}^2$  or  $l_{N_2}^1, l_{N_3}^1$  and  $l_{N_4}^1$ , respectively. In the case of non-linear difference equations a region, which depends on the initial conditions and the parameters of the equation, where the solution holds, is given. For both linear and non-linear difference equations a bound of the solution is determined.

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