

Periodic Solutions in Nonlinear Neutral Difference Equations with Functional Delay

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Abstract:

We use Krasnoselskii's fixed point theorem to show that the nonlinear neutral difference equation with delay

$$x(t + 1) = a(t)x(t) + c(t)\Delta x(t - \tau) + q(t, x(t - \tau))$$

has a positive periodic solution. To apply Krasnoselskii's fixed point theorem, one would need to construct two mappings; one is a contraction and the other is compact. An example will be provided.