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On the periodic logistic equation. (English) Zbl 1109.90010

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Summary: We show that the p-periodic logistic equation $x_{n+1} = \mu_{n \bmod p} x_n(1 - x_n)$ has cycles (periodic solutions) of minimal periods $1, p, 2p, 3p, \dots$ Then we extend Singer's theorem to periodic difference equations, and use it to show the p-periodic logistic equation has at most p stable cycles. Also, we present computational methods investigating the stable cycles in case $p = 2$ and 3.

MSC:

90B06	Transportation, logistics and supply chain management
39A11	Stability of difference equations (MSC2000)
37C25	Fixed points and periodic points of dynamical systems; fixed-point index theory, local dynamics
37C70	Attractors and repellers of smooth dynamical systems and their topological structure

Keywords:

logistic map; non-autonomous; periodic solutions; Singer's theorem; attractors

Full Text: DOI

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