

Meehan, Maria; O'Regan, Donal

Existence theory for nonlinear Fredholm and Volterra integral equations on half-open intervals. (English) Zbl 0920.45006

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The authors study the existence of solutions of Volterra integral equations of the form

$$y(t) = h(t) + \int_0^t k(t, s)g(s, y(s))ds, \quad 0 \leq t < T,$$

where $0 \leq T \leq \infty$ with particular emphasis on the case $T = \infty$. Some results on the corresponding Fredholm equation $y(t) = h(t) + \int_0^T k(t, s)g(s, y(s))ds$ are also given. First the authors derive some existence principles based mainly on a nonlinear alternative of Leray-Schauder type but with complicated assumptions. These principles are then used to derive a number of existence and comparison results, including results on the asymptotic behavior of the solution, with easily verifiable assumptions. In many cases the assumptions on the kernel k involve some form of "log-convexity". A large number of examples are given too.

Reviewer: [Gustaf Gripenberg \(Hut\)](#)

MSC:

[45G10](#) Other nonlinear integral equations

[45M05](#) Asymptotics of solutions to integral equations

Cited in **26** Documents

Keywords:

[half-open intervals](#); [existence](#); [log-convex kernel](#); [nonlinear Volterra integral equation](#); [nonlinear Fredholm integral equation](#); [asymptotic behavior](#)

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