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一维 p -拉普拉斯三个正解的存在性

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摘要 考虑边值问题: $\left(\varphi_p(x'(t))\right)' + q(t)f(t, x(t), x'(t)) = 0, p > 1, t \in [0, 1]$, 边值条件为 $x(0) = x(1) = 0$ 或 $x(0) = x'(1) = 0$. 借助于一个新的不动点定理我们获得了存在至少三个正解的充分条件.

问题的关键是非线性项 f 依赖于未知函数的一阶导数. 最后, 给出一个具体的例子.

关键词 [\$p\$ -拉普拉斯](#) [边值问题](#) [不动点定理](#)

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Existence of Three Positive Solutions for the One-Dimensional p -Laplacian

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Abstract We consider the boundary value problem: $\left(\varphi_p(x'(t))\right)' + q(t)f(t, x(t), x'(t)) = 0, p > 1, t \in [0, 1]$, with $x(0) = x(1) = 0$ or $x(0) = x'(1) = 0$. By using a new fixed point theorem, sufficient conditions are obtained that guarantee the existence of at least three positive solutions. The key point here is that the nonlinear term f is dependent on the first order derivative. An example is that also included to illustrate the importance of the results obtained.

Key words [\$p\$ -Laplacian](#) [boundary value problem](#) [fixed-point theorem](#)

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