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# Multiple Solutions and Its Morse Index for One-Dimensional Nonlinear Problem

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摘要 The multiple solutions for one-dimensional cubic

nonlinear problem  $u''+u^3=0, u(0)=u(\pi)=0$  are computed, on the

basis of the eigenpairs of  $-\phi''_k=\lambda_k \phi_k, \ k=1,2,3$

$\cdots$ . There exist two nonzero solutions  $\pm u_k$

corresponding to each  $\lambda_k$ , and their Morse index  $MI(k)$  for

$1 \leq k \leq 20$  is to be exactly determined. It is shown by the

numerical results that  $MI(k) \geq k$ .

关键词 [Nonlinear problem, multiple solutions, series expression, Morse index](#)

分类号

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### Abstract

### Key words

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