

Common Eigenvalue Problems

Find eigenvalues, eigenfunctions and function representation in text and exercises.

Eigenvalue problem	Eigenvalues	Eigenfunctions	Function Representation
$\phi'' + \lambda^2 \phi = 0, 0 < x < a$ $\phi(0) = 0, \phi(a) = 0,$	$\lambda_n = n\pi/a, n = 1, 2, \dots$	$\phi_n(x) = \sin(\lambda_n x)$	$b_n = \frac{2}{a} \int_0^a f(x) \sin(\lambda_n x) dx$ $f(x) = \sum_{n=1}^{\infty} b_n \sin(\lambda_n x), \quad 0 < x < a$
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