Abstract

The focus of the research presented in this paper was, for the singular boundary value problem given as

$$\begin{aligned} (-x^n y')' &= \lambda x^m y \\ y(0) = 0, y(1) &= 0 \end{aligned} \tag{1}$$

defined on the interval $(0, 1)$, to examine the affects of changing the value of m and n on the eigenvalues and eigenfunctions that were obtained. The researcher employed the shooting method by numerically solving the initial value problem $(-x^n y')' = \lambda x^m y$, defined on the interval $(0, 1)$, and subject to the initial conditions $y'(1) = -1, y(1) = 0$ for various values of λ.