

MATH 513
Assignment 3

Solve the following Sturm – Liouville problems. Write the eigenfunctions in normalized form and state the orthogonality relation.

1) $\frac{d^2 y}{dx^2} - \frac{dy}{dx} + \lambda y = 0, 0 < x < 1$
 $y(0) = 0 = y(1)$

2) $(xy'(x))' + \frac{\lambda}{x} y(x) = 0, 1 < x < b$
 $y'(1) = 0, y(b) = 0.$

3) $(x^3 y')' + \lambda xy(x) = 0, 1 < x < e$
 $y(1) = 0, y(e) = 0.$