B.Math II-Ordinary Differential Equations

Assignment 1

1. From Simmons and Krantz Book, chapter 3:
   - page 137-138, question 2 and 4.
   - page 141, question no. 2.
2. For $x \in [0, l]$, find the Green function for
$$y''(x) = 0$$
with boundary conditions
$$y(0) = y(l) = 0$$
3. Find all the eigenvalues and eigenfunctions for the Strum-Liouville problem
$$y'' + \lambda y = 0$$
with conditions
$$y(0) + y'(0) = 0$$
and
$$y(1) + y'(1) = 0.$$
4. Find the orthogonal expansion of
$$f(x) = \pi x - x^2, \qquad 0 \leq x \leq \pi$$
in the series of the orthogonal eigen functions of Strum-Liouville problem
$$y'' + \lambda y = 0,$$
with boundary conditions
$$y(0) = y(1) = 0.$$