Name:...ID#:................................Ser:..............

Q.1: Find Fourier series expansion of $f(x) = \begin{cases} 0 & -\pi < x < 0 \\ \pi - x & 0 < x < \pi \end{cases}$

Q.2: Find eigenvalues and eigenfunctions of $y'' + \lambda y = 0, \; y'(0) = 0, \; y'(L) = 0.$

Q.3: Write $xy'' + (1-x)y' + ny = 0, \; n = 0, 1, 2, \cdots$ into self-adjoint form.