國立成功大學

工程科學學系

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數值方法

HW 11

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Given the equation $y'' = -(x+1)y' + 2y + (1-x^2)e^{-x}$, $0 \le x \le 1$, $y(0) = 1$,

$y(1) = 2$

use $h = 0.1$

Questions:

a. Use the shooting method to approximate the solution of the problem

b. Use the finite-difference method to approximate the solution

c. Use the variation approach to approximate the solution.

x	(a) Shooting Method	(b) Finite Difference	(c) Variational Method
0.0	1.000000	1.000000	1.000000
0.1	1.016634	0.983137	1.252855
0.2	1.059210	1.033075	1.487479
0.3	1.124314	1.104267	1.699329
0.4	1.209024	1.193836	1.883303
0.5	1.310523	1.299262	2.033593
0.6	1.426232	1.418382	2.143497
0.7	1.554455	1.549374	2.205204
0.8	1.693764	1.690735	2.209512
0.9	1.842715	1.841259	2.145482
1.0	2.000000	2.000000	2.000000