

Assignment 4 for ANT Lab

04/02/2020

Solve the following boundary value problem using finite difference method. Print nodes, numerical values of unknown u , exact values, as well as absolute error.

Problem 1:

$$u''(x) = -\left(\frac{1}{8}\right)(32 + 2x^3 - u u'); \quad u(1) = 17, \quad u(3) = 43/3.$$

Take $h = 0.05$. [Exact solution: $x^2 + (16/x)$]

Problem 2:

$$u''(x) = -u'^2 - u + \ln x; \quad u(1) = 0, \quad u(2) = \ln 2.$$

Take $h = 0.025$. [Exact solution: $\ln x$]