

# Elementary Numerical Partial Differential Equations

## Homework 1

(Due: Oct. 25, 2007)

Consider the boundary value problem (BVP)

$$\begin{aligned}u''(x) &= f(x), & -1 < x < 1, \\u(-1) &= \alpha, \\u(1) &= \beta.\end{aligned}$$

Implement (2.10) to write a program to solve the BVP with various grid sizes and boundary conditions as follows

- $f(x) = 2, \quad \alpha = \beta = 1.$
- $f(x) = 12x^2 - 4, \quad \alpha = \beta = 0.$
- $f(x) = 12x^2, \quad \alpha = \beta = 1.$
- $f(x) = e^x, \quad \alpha = e^{-1}, \quad \beta = e^1.$

Discuss the results.