

ESM 5734
Homework #10
Due on 14 November 2022 at 11:15 AM

For the boundary-value problem defined by

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + 3u = 0 \text{ in } \Omega,$$

and boundary conditions shown in the Fig., find an approximate solution of the problem by using quadrilateral elements. For 5×5 , 10×10 and 15×15 uniform FE meshes, find the error norms $\|u\|_0$ and $\|u\|_1$. The analytical solution may be assumed to be of the form

$$u(x, y) = f(x) \sin \frac{\pi y}{a}$$

