

Exercise 8

Consider the problem $u_{xx} + u_{yy} = 0$ in the triangle $\{x > 0, y > 0, 3x + y < 3\}$ with the boundary conditions

$$u(x, 0) = 0 \quad u(0, y) = y(3 - y) \quad u(x, 3 - 3x) = 0$$

Choose $w_0 = y(3 - 3x - y)$ and $w_1 = xy(3 - 3x - y)$. Find the Rayleigh–Ritz approximation $w_0 + c_1 w_1$ to u . That is, use Exercise 7 to find the constant c_1 .