1. Classify the partial differential equation $xf_{xx} + yf_{yy} = 0, x > 0, y > 0$

2. Classify the partial differential equation $x^2 f_{xx} + (1 - y^2)f_{yy} = 0$

3. Solve $\nabla^2 u = 0$ at the nodal points for the following square region given the boundary condition

4. Solve $\nabla^2 u = 0$ for the square region with the given boundary conditions

5. By Iteration method, solve the Laplace equation $u_{xx} + u_{yy} = 0$, over the square region, satisfying the boundary conditions.

$u(0, y) = 0, 0 \le y \le 3$

$u(3, y) = 9 + y, 0 \le y \le 3$

$u(x,0) = 3x, 0 \le x \le 3$

$u(x,3) = 4x, 0 \le y \le 3$