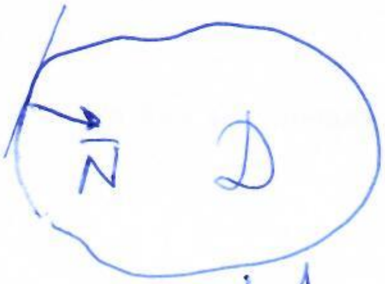
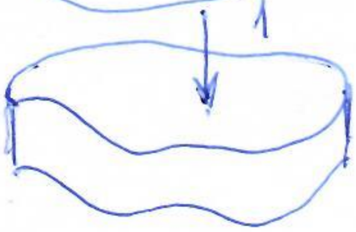
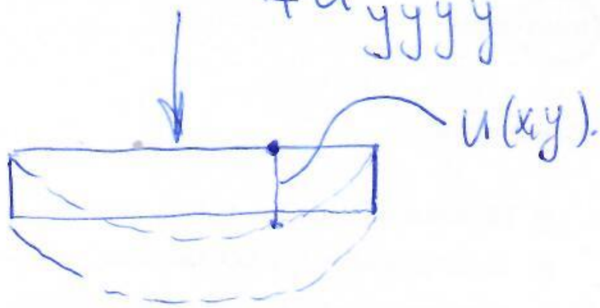




$$\begin{cases}\Delta^2 u = 1\\ u\big|_\Gamma = 0\\ \dfrac{\partial u}{\partial N}\Big|_\Gamma = 0\end{cases}$$

$u(x,y) \neq 0$?

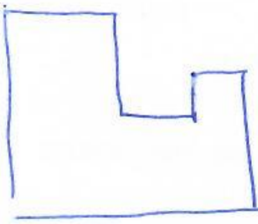
$$\Delta^2 u = u_{xxxx} + 2u_{xxyy} + u_{yyyy}$$



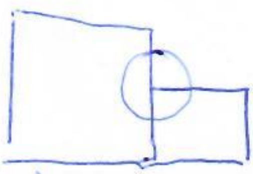
$x^2+y^2 \le R^2.$ $(R^2-x^2-y^2)^2 = u_0$

$u_{0xxxx} = 4! = u_{0yyyy}$ $(2x^2y^2)_{xxyy} = 8$

$\Delta^2 u_0 = 56$ $u = \frac{1}{56} u_0$



$$-\iint_D u\,dxdy + \iint_D (\Delta u)^2\,dxdy = J(u)$$



$$F = (\Delta u)^2 = u_{xx}^2 + 2u_{xx}u_{yy} + u_{yy}^2$$

$$-F_u - \frac{\partial}{\partial x}F_{u_x} + \frac{\partial^2}{\partial x^2}F_{u_{xx}} - \frac{\partial}{\partial y}F_{u_y} + \frac{\partial^2}{\partial y^2}F_{u_{yy}} + \cancel{2\frac{\partial^2}{\partial x\partial y}F_{xy}}^{=0}$$

$$1 + 2u_{xxxx} + 2u_{yyyy} + 2u_{xxyy} + 2u_{xxyy} = 0$$

$F_{u_{xx}} = 2u_{xx} + 2u_{yy}$

$F_{u_{yy}} = 2u_{yy} + 2u_{xx}$

$$\Delta^2 u = 1.$$