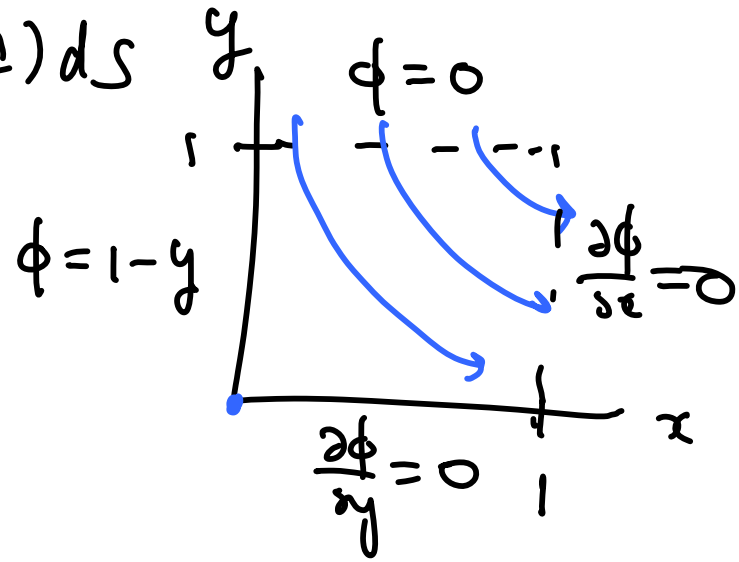
- Example 1 : $\int_S \rho\phi(\underline{u}\cdot\underline{n})\,dS = \int_S \Gamma(\nabla\phi\cdot\underline{n})\,dS$



$\underline{u} = (u_x, u_y) = (x, -y)$

stagnation flow

convection term : UDS or CDS

diffusion " : CDS

ⓐ $x=1$, $\frac{\partial\phi}{\partial x} = 0$ ← one-side difference

ⓑ $y=0$, $\frac{\partial\phi}{\partial y} = 0$ ← " "

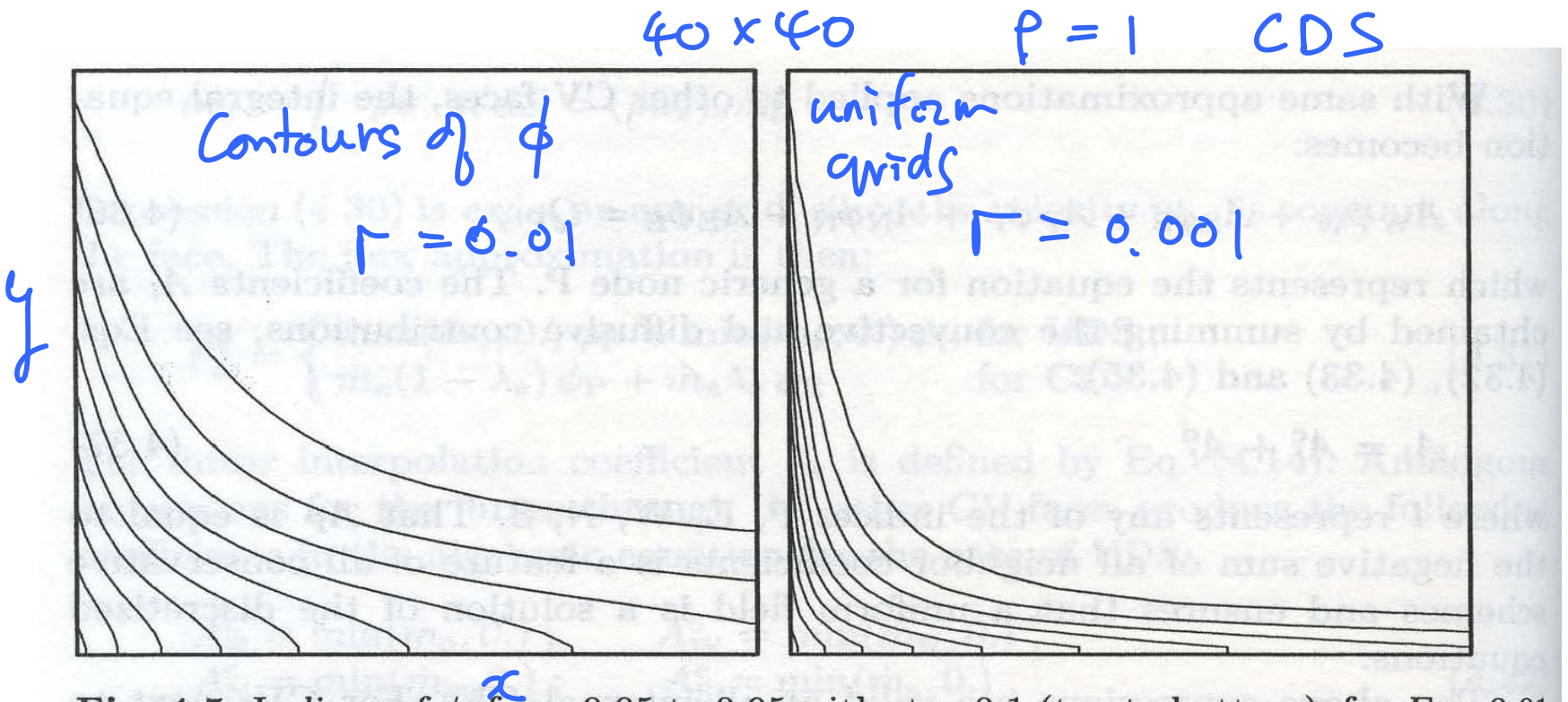


Fig. 4.5. Isolines of ϕ, from 0.05 to 0.95 with step 0.1 (top to bottom), for $\Gamma = 0.01$ (left) and $\Gamma = 0.001$ (right)

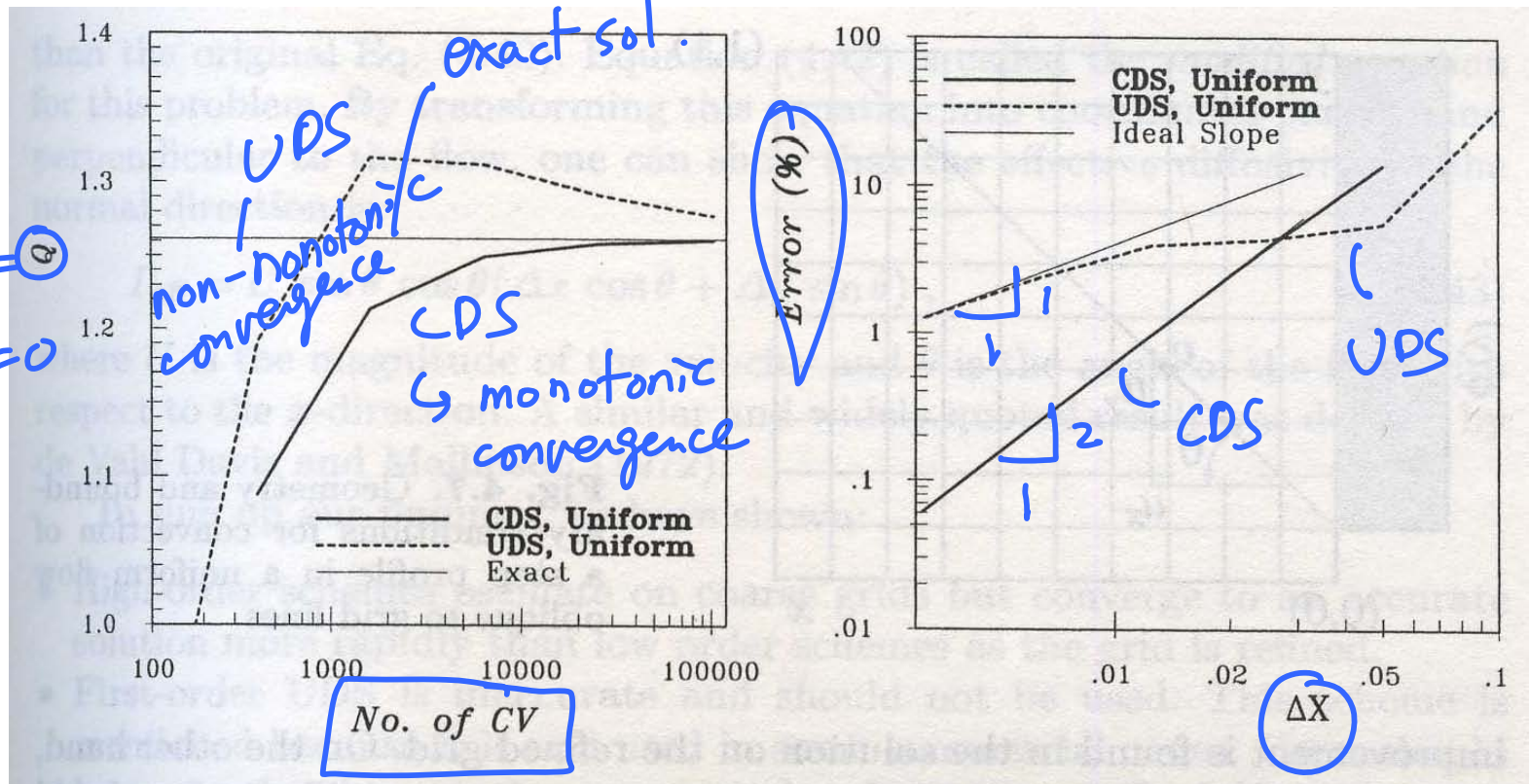


Fig. 4.6. Convergence of total flux of ϕ through the west wall (left) and the error in computed flux as a function of grid spacing, for $\Gamma = 0.001$

HW 4