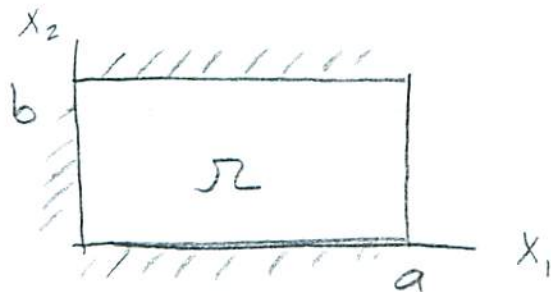
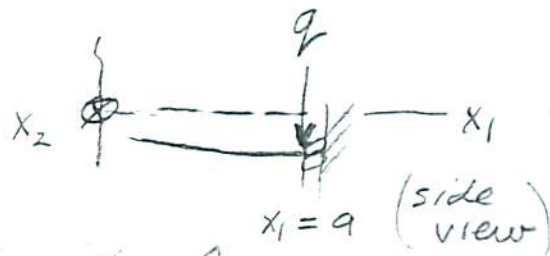
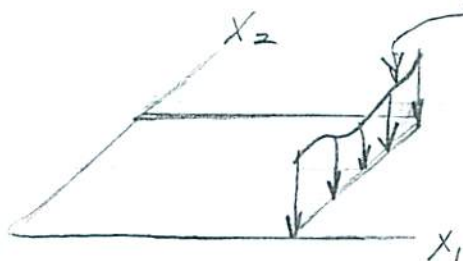


- ① Consider a rectangular plate  $\Omega = (0, a) \times (0, b)$  as in the notes p. 148.



On the 3 "hatched" sides the plate is clamped, i.e.,  $w = \nabla w \cdot \underline{n} = 0$ . On the side  $x_1 = a$ ,  $0 \leq x_2 \leq b$ , suppose that  $\nabla w \cdot \underline{n} = 0$  and that a vertical line load of intensity  $q(x_2)$  is acting.



The line-load contributes the following additional term to  $I(w)$  (p. 139):

$$- \int_0^b q(x_2) w(a, x_2) dx_2.$$

Determine the natural boundary conditions along the edge  $x_1 = a$ ,  $0 \leq x_2 \leq b$ .

(2) Referring to the example on nonlinear elasticity (p. 159), suppose that

$$\tilde{u}|_{\partial\Omega_1} = \hat{u}|_{\partial\Omega_1}$$

is prescribed over a portion  $\partial\Omega_1 \subset \partial\Omega$  of the boundary. Determine the natural boundary conditions on the complementary portion of the boundary  $\partial\Omega_2 \equiv \partial\Omega - \partial\Omega_1$ .