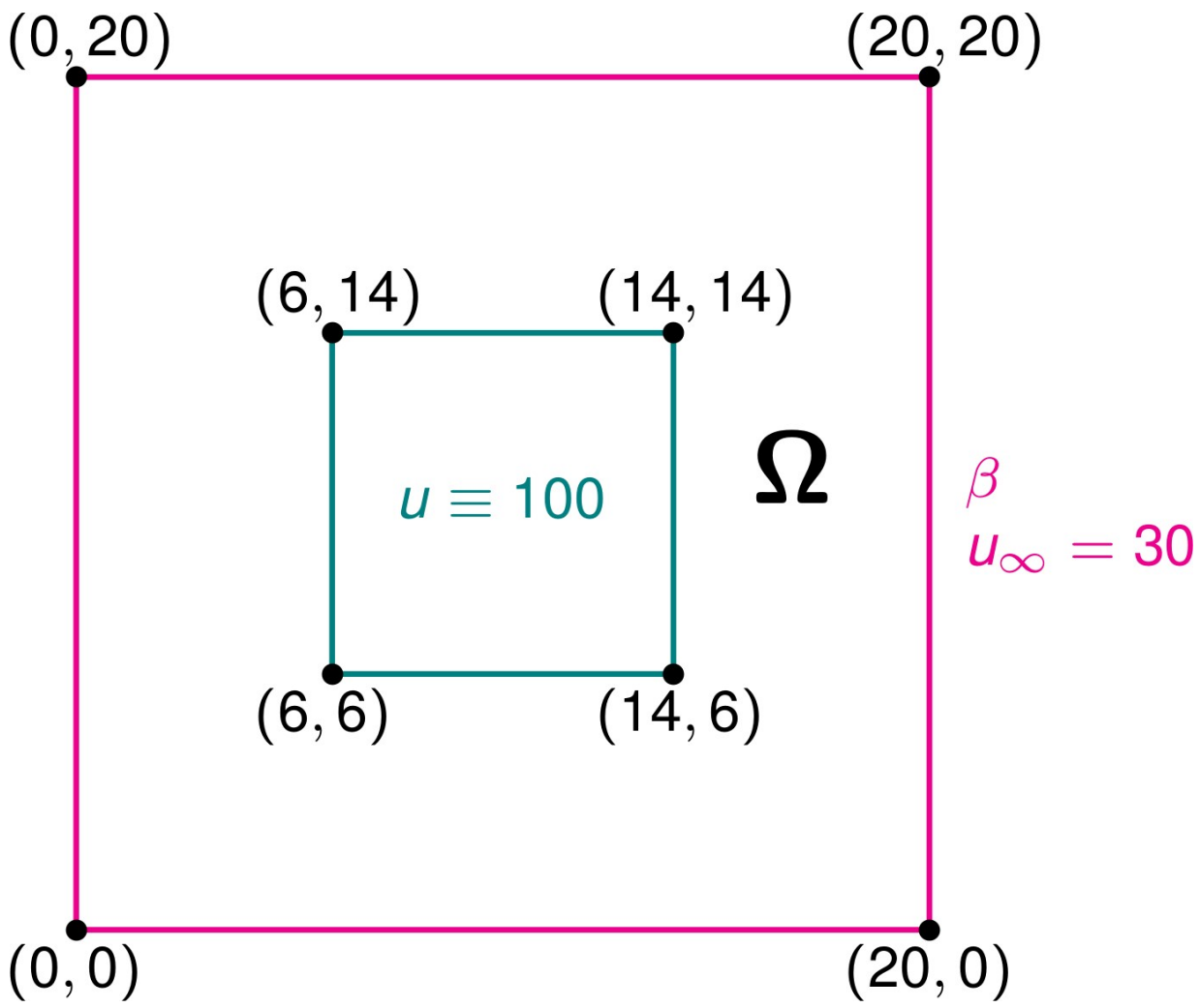
Començat el	dimecres, 16 juny 2021, 19:13
Estat	Acabat
Completat el	dimecres, 16 juny 2021, 19:13
Temps emprat	16 segons
Punts	-0,25/1,00
Qualificació	**-2,50** sobre 10,00 (**-25**%)

Informació



Pregunta **1**

Incorrecte

Puntuació -0,25 sobre 1,00

Consider the thermal equilibrium determined by the following six data.
1) The thermal conductivity $k_c = 1.1$.
2) Without sources or sinks of internal heat: $f(x, y) = 0$.
3) The domain Ω given by the square $[0, 20] \times [0, 20]$ minus the square hole $[6, 14] \times [6, 14]$. (See the figure.)
4) An essential BC $u \equiv 100$ at the inner boundary, the one in teal.
5) A convective BC at the outer boundary, the one in magenta, with conductivity coefficient $\beta = 21$ and bulk temperature $u_\infty = 30$.
6) To represent the domain take the triangular mesh `chimenea2` which is part of the official set of meshes.

(a)(points=4) Compute the value of the element K_{11} (first row, first column) of the global rigidity matrix before applying the convective BC.

1.8089e+00 ✖

1.6403e+00

Leave it empty (no penalty)

1.3438e+00

9.2074e-01

La resposta correcta és: 9.2074e-01

Check: $K_{55} = 2.8184e+00$ (before applying the convective BC).

(b)(points=3) Compute the value of the first secondary variable Q_1 after the post-process.

-1.4458e-01 ✖

-1.9122e-01

-1.2432e-01

Leave it empty (no penalty)

-2.3082e-01

La resposta correcta és: -1.2432e-01

Check: Its value before the post-process is $Q_1 = \beta u_\infty/2 = 3.1500e+02$.

(c) (points=3) The exact solution of this problem has several symmetries. To be precise, given any $x_p \in [0, 6]$ it has the same value at the four symmetric points $p_1 = (x_p, 10)$, $p_2 = (20 - x_p, 10)$, $p_3 = (10, x_p)$, and $p_4 = (10, 20 - x_p)$. On the contrary, the approximate solution does not have the same symmetries. We are going to estimate its symmetry error. Let $x_p = 3.6$. Compute the interpolated values u_1, u_2, u_3, and u_4 at the points p_1, p_2, p_3, and p_4, respectively. Compute the difference $\max_{1\le j\le 4}(u_j) - \min_{1\le j\le 4}(u_j)$.

1.1701e-04

Leave it empty (no penalty)

5.6159e-04 ✖

4.8406e-04

1.6441e-05

La resposta correcta és: 4.8406e-04

Check: The interpolated temperature u_1 at p_1 is $7.0054e+01$.

◄ P1-ExFinal-2Q-2020-21(Ha habido un problema técnico, pasad al P2) (ocult)

Salta a...

P3-ExFinal-2Q-2020-21 ►