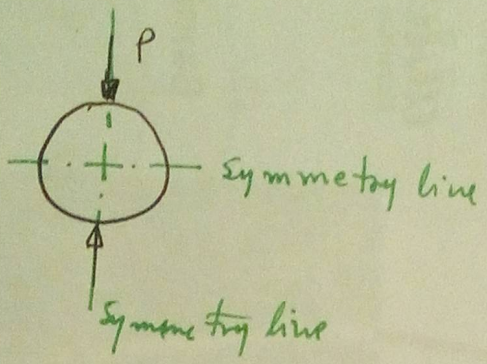
Jorge Alvarez Tello

16/02/17

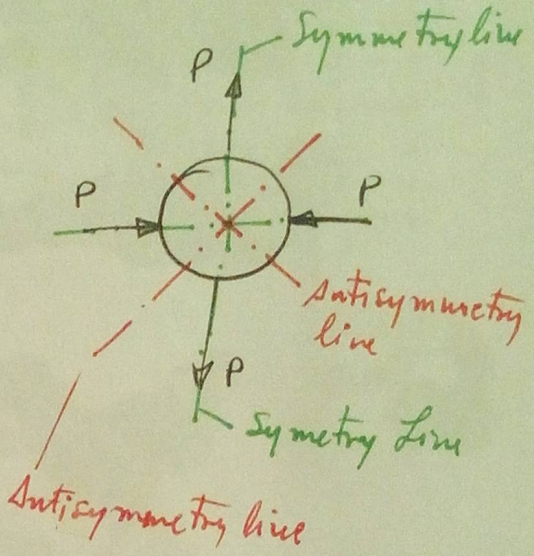
Assignment 2.1.

1. Symetry / Antisymetry.

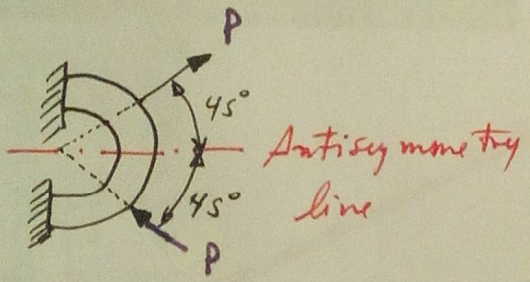
a)



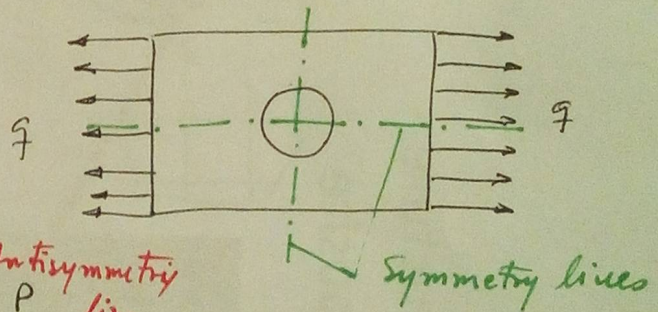
b)



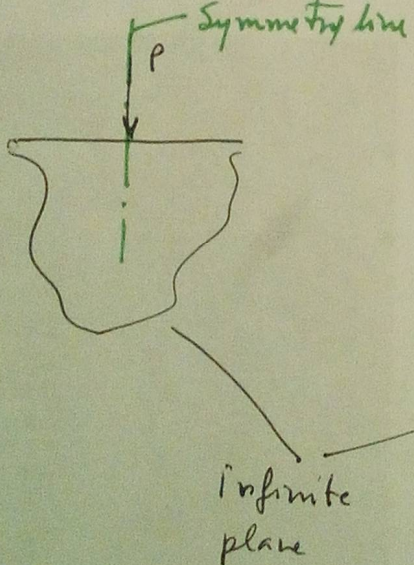
c)



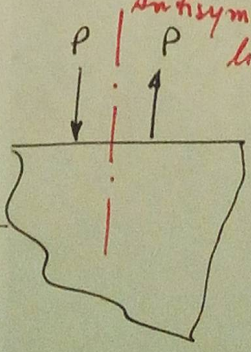
d)



e)

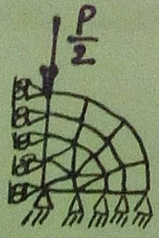


f)

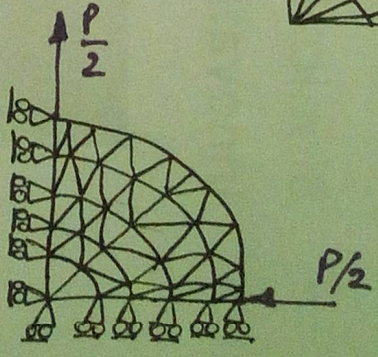


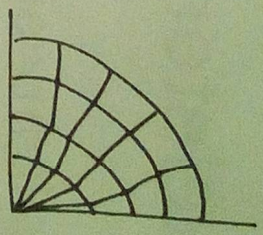
2.

a)

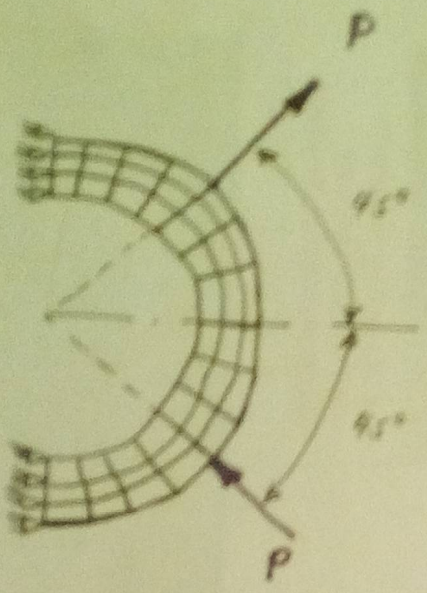


b)

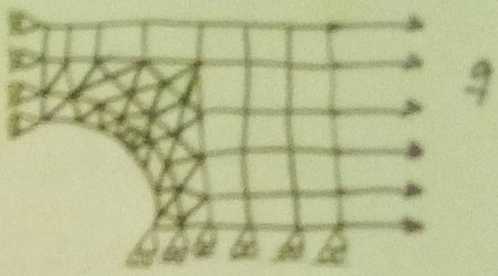




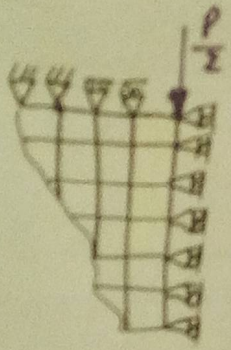
c)



d)



e)



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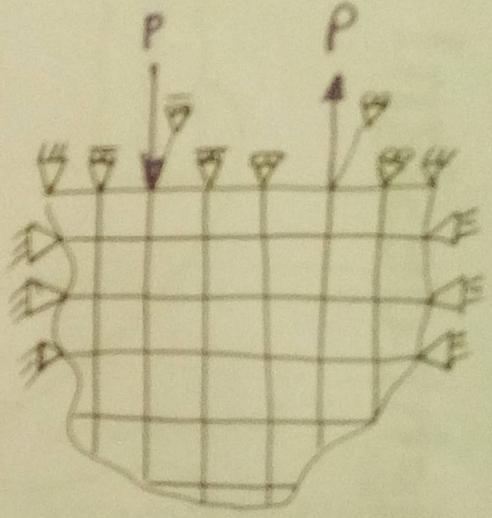
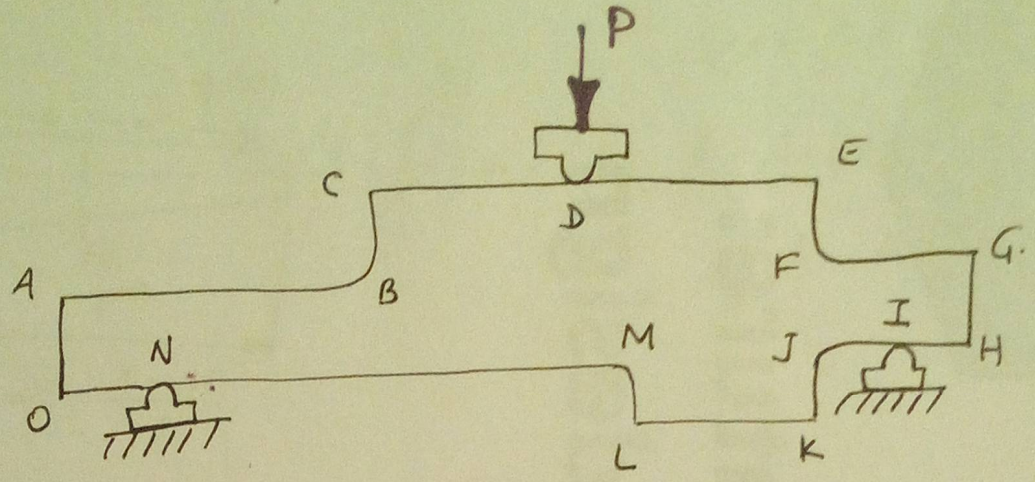


Assignment 2.2

1.

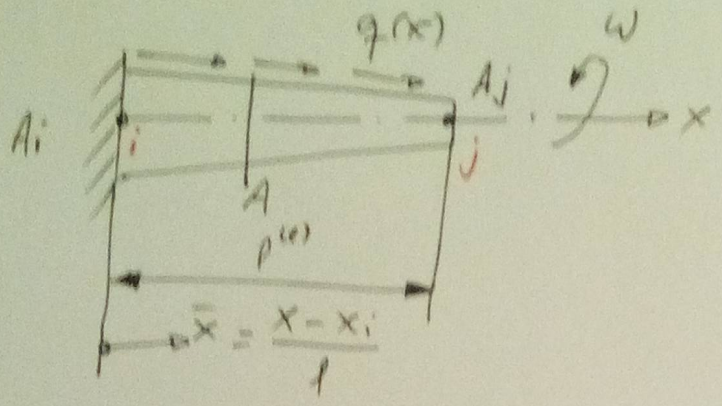


Trouble spots

Letter	Reason
B, F, M, J	entrant corners
N, I	Vicinity of concentrated (point) loads. through the sharp contact areas. (concentrated reactions).
D	Vicinity of concentrated (point) loads through the sharp contact areas (concentrated actio)

Assignment 2.3

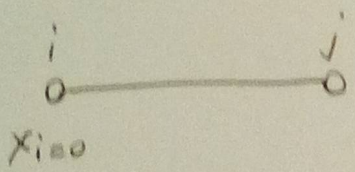
ρ : constant



$q(x) = \rho A \omega^2 x \; ; \; x = x^e$

$A = A_i(1-\xi) + A_j \xi$

$= [A_i \; A_j] \begin{bmatrix} 1-\xi \\ \xi \end{bmatrix}$



$\xi = \frac{x - x_i}{l} \longrightarrow d\xi = \frac{dx}{l} \longrightarrow dx = l\, d\xi$

Nodal force Vector:

$$f^{(e)} = \int_0^l q \begin{bmatrix} 1-\xi \\ \xi \end{bmatrix} l\, d\xi = \int_0^l \rho A \omega^2 x \begin{bmatrix} 1-\xi \\ \xi \end{bmatrix} dx$$

$$f_i^e = \int_0^l \rho \omega^2 x A_i (1-\xi)\, dx = \rho \omega^2 A_i \int_0^l (1 - \tfrac{x}{l}) x\, dx$$

$$f_i^e = \rho \omega^2 A_i \left(\frac{x^2}{2} - \frac{x^3}{3l} \Big|_0^l \right) = \rho \omega^2 A_i \left(\frac{l^2}{2} - \frac{l^2}{3} \right)$$

$$f_i^e = \rho \omega^2 A_i \frac{l^2}{6} \; \#$$

$$f_j^e = \int_0^l \rho \omega^2 x A_j \xi\, dx = \rho \omega^2 A_j \int_0^l (\tfrac{x}{l}) x\, dx = \rho \omega^2 A_j \left(\frac{x^3}{3l} \Big|_0^l \right) =$$

$$f_j^e = \rho \omega^2 A_j \frac{l^2}{3} \; \#$$