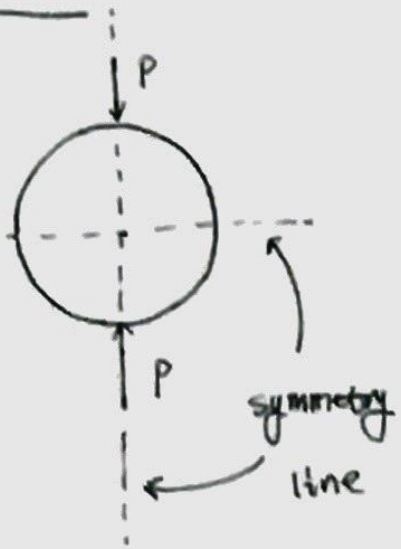
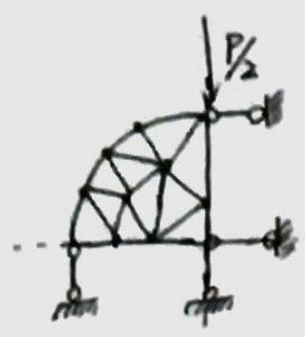


2.1

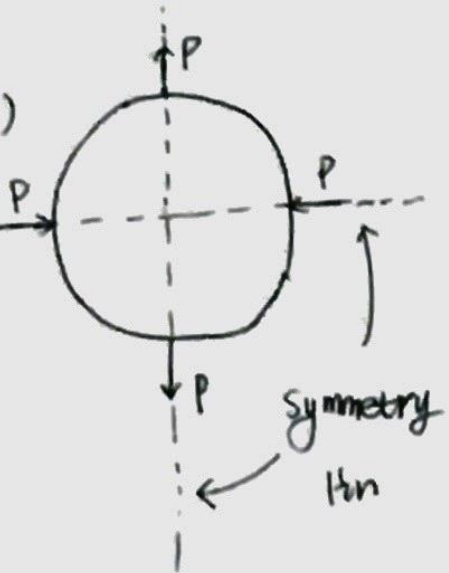
(a)



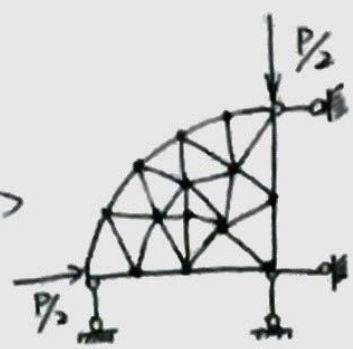
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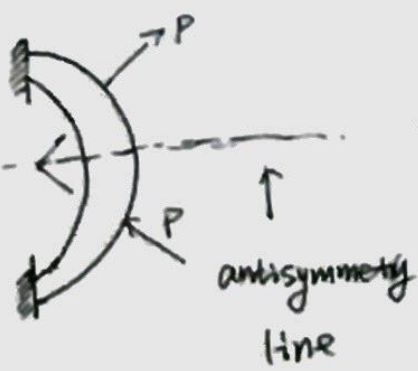
(b)



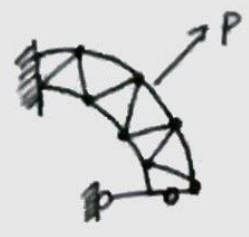
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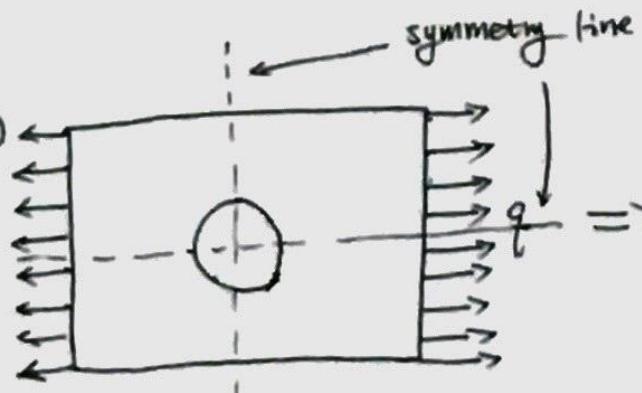
(c)



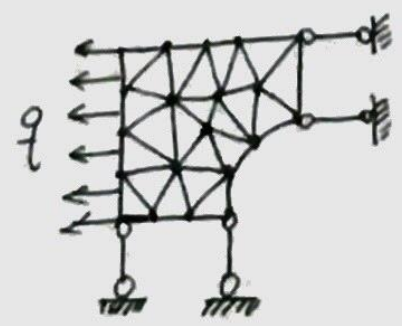
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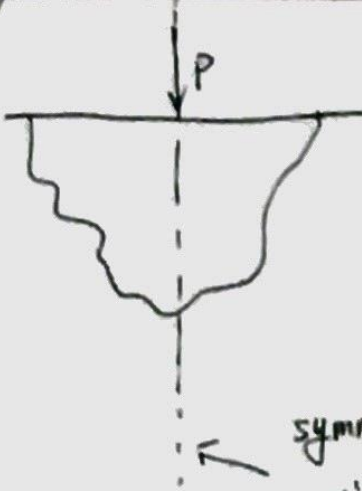


(d)

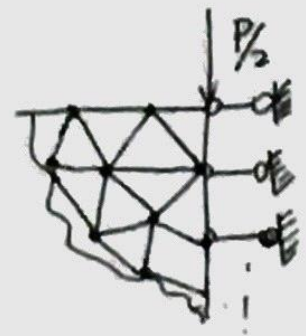


=>



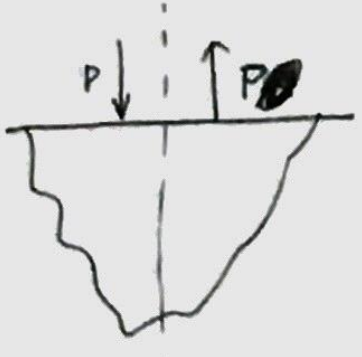


\Rightarrow

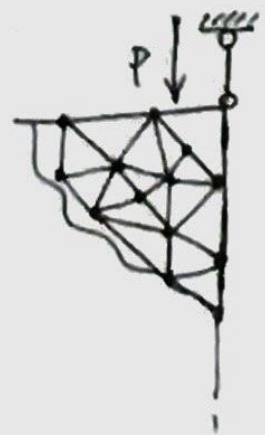


← symmetry line

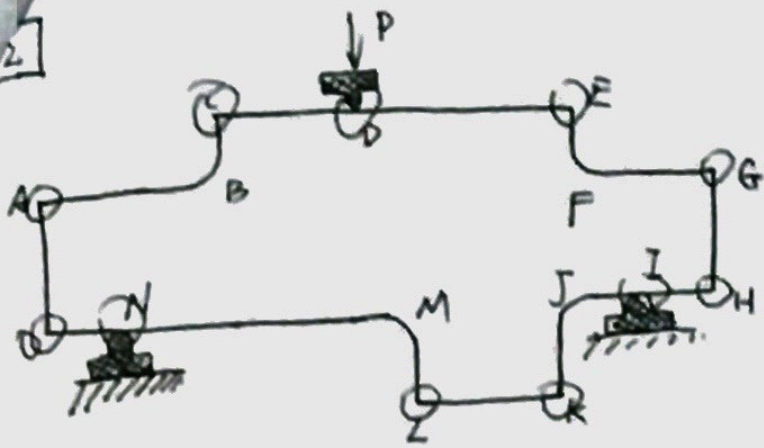
(f)



\Rightarrow



← antisymmetry line

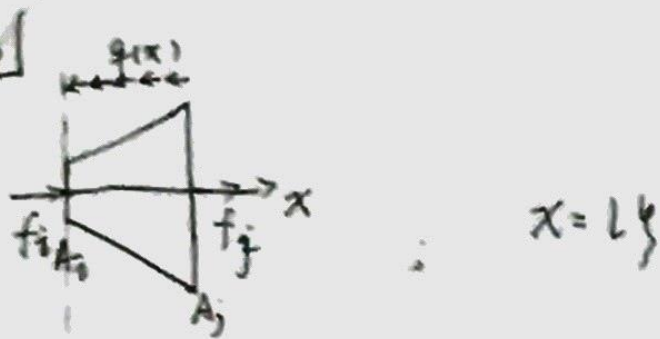


①: N, D, I, D

Because the forces acting on these spots, so there will be stress concentration phenomenon which needs finer finite element.

②: A, C, E, G, H, K, L, O

Because these spots have sharp shape, which will also cause the stress concentration phenomenon. So they need finer finite element.



or

$$\underline{f_e} = \begin{bmatrix} f_i \\ f_j \end{bmatrix} = \int_0^L q(x) \begin{bmatrix} 1-\xi \\ \xi \end{bmatrix} dx$$

$$= - \int_0^L p w^2 \cdot (A_i(1-\xi) + A_j \xi) \cdot L \xi \cdot \begin{bmatrix} 1-\xi \\ \xi \end{bmatrix} \cdot L \cdot d\xi$$

$$= - \frac{1}{12} \begin{bmatrix} p w^2 L^2 (A_i + A_j) \\ p w^2 L^2 (A_i + 3A_j) \end{bmatrix}$$

When $A_i = A_j = A$.

$$\underline{f_e} = \begin{bmatrix} f_i \\ f_j \end{bmatrix} = - \begin{bmatrix} \frac{1}{6} \cdot p w^2 L^2 \cdot A \\ \frac{1}{3} \cdot p w^2 L^2 \cdot A \end{bmatrix}$$