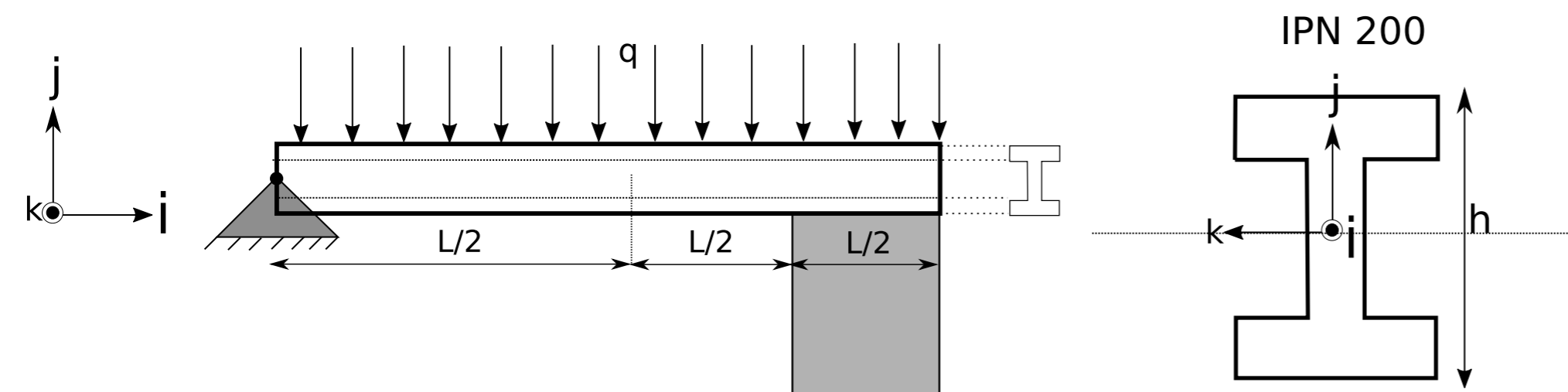
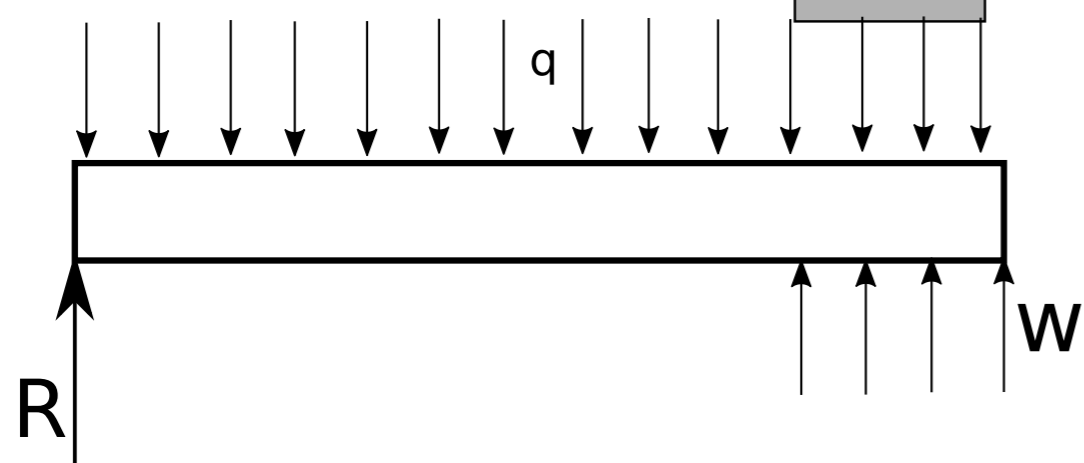


Ejercicio 1



1)a)

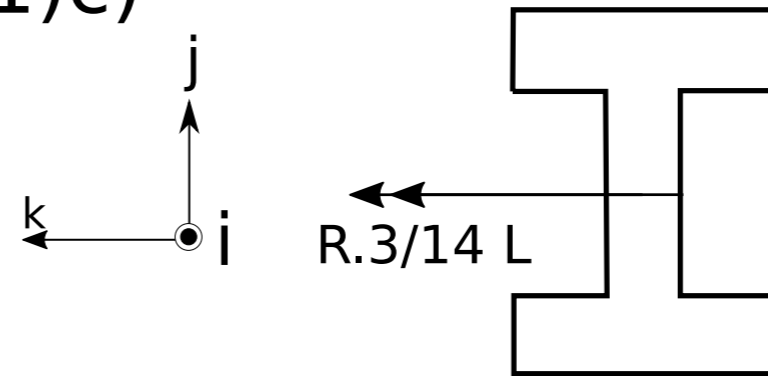


Eq de Fuerzas : $R + w L/4 = q.L$
 Eq de Momentos $q L (L/2) = w.L/4.7L/8$

$$w = 16/7 q$$

$$R = q L(1 - 16/28) = qL (3/7)$$

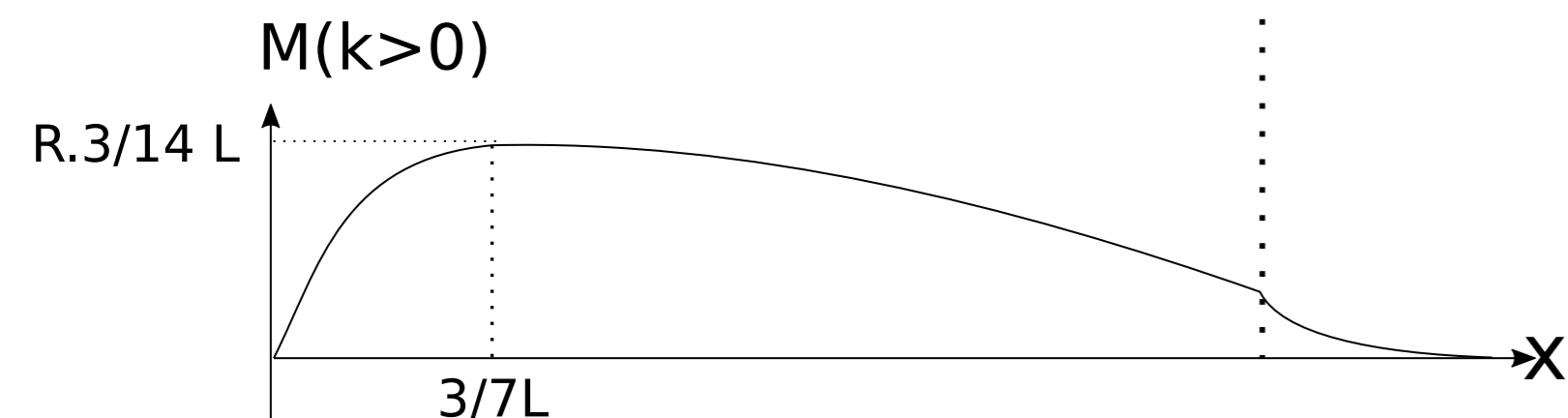
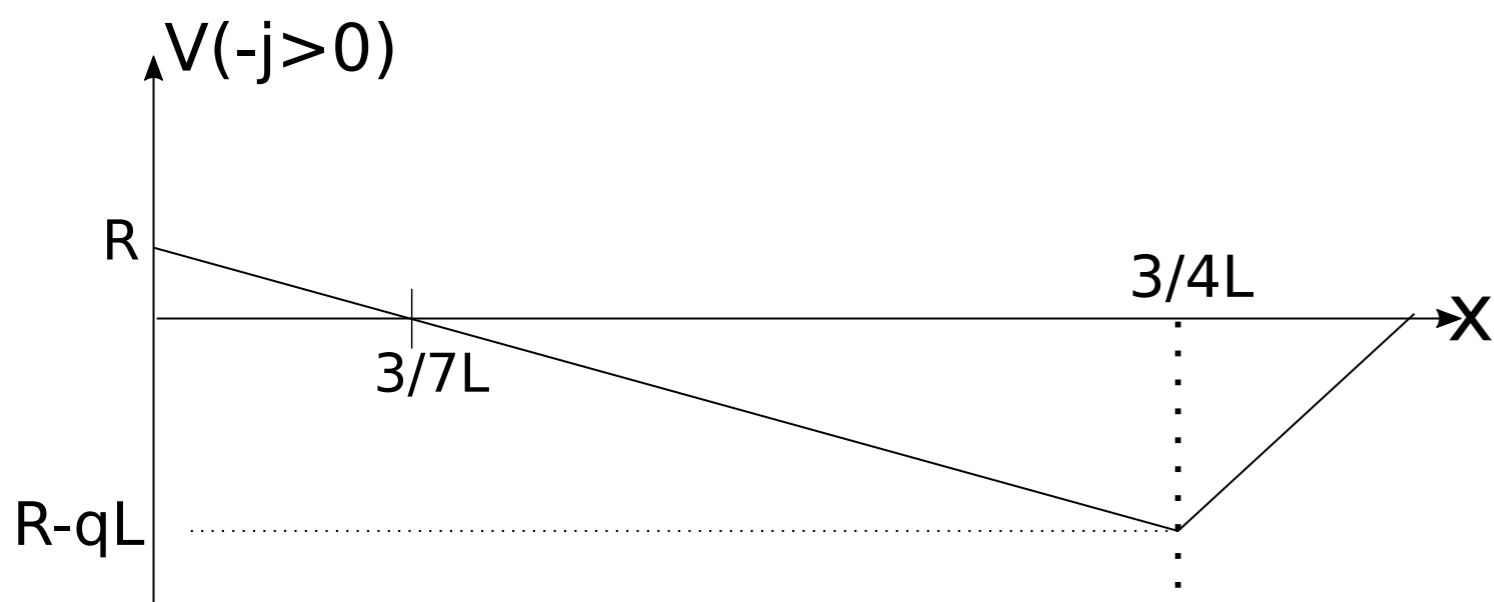
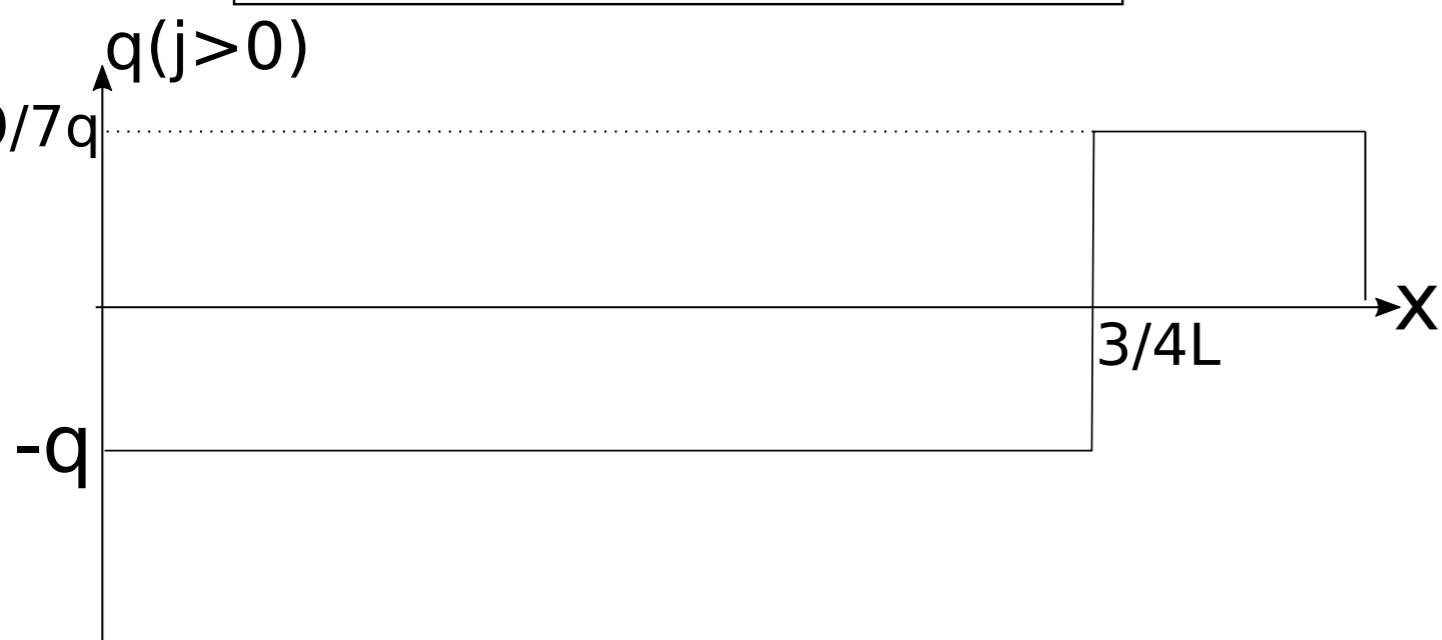
1)c)



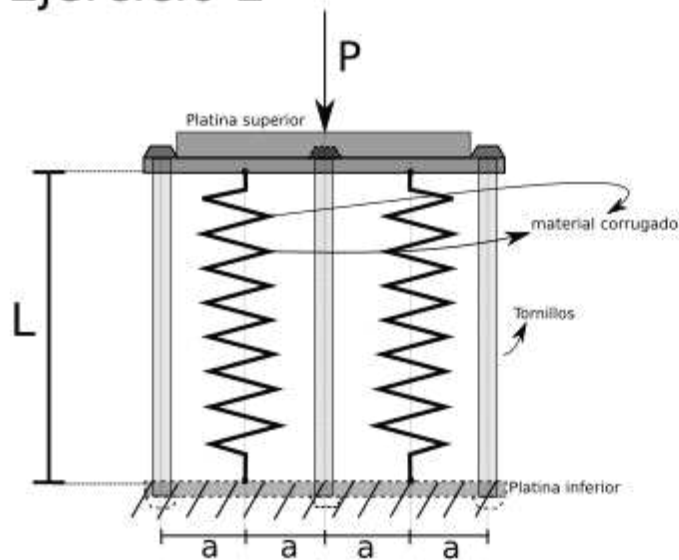
El valor del esfuerzo principal máximo se da en el punto superior e inferior del perfil I y vale:

$$\sigma = \frac{R.3/14 L \cdot h/2}{I_k} = 200 \text{ MPa}$$

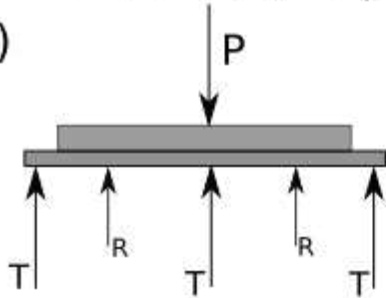
1)b)



Ejercicio 2



1)a)



Los tornillos ejercen fuerza axial en el sentido vertical al igual que los resortes ya que sufren la compresión de la platina superior

Eq Fuerzas: $P \stackrel{1}{=} 2R + 3T$

1)b)



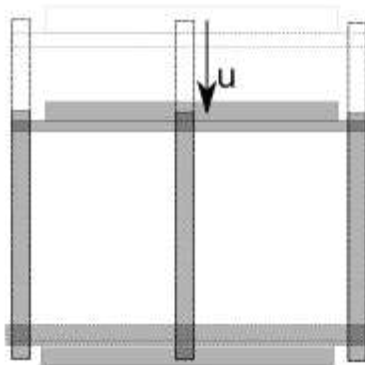
1)c)



Condición de deformacion:

Todo el conjunto se mueve solidariamente por lo que el decenso de cada uno de los tornillos es igual al de los resortes

2)a)



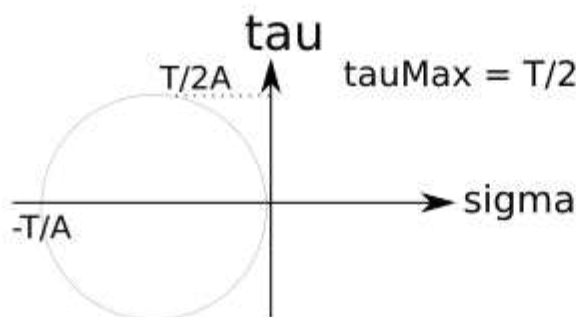
$u = T \cdot L / E_T A_T - \alpha L (T_f - T_0) = R/k \stackrel{2}{=} 0.69\text{mm}$

Sustituyendo 1 en 2 y despejando:

$R = 344 \text{ N}$

$T = 10.2\text{kN}$

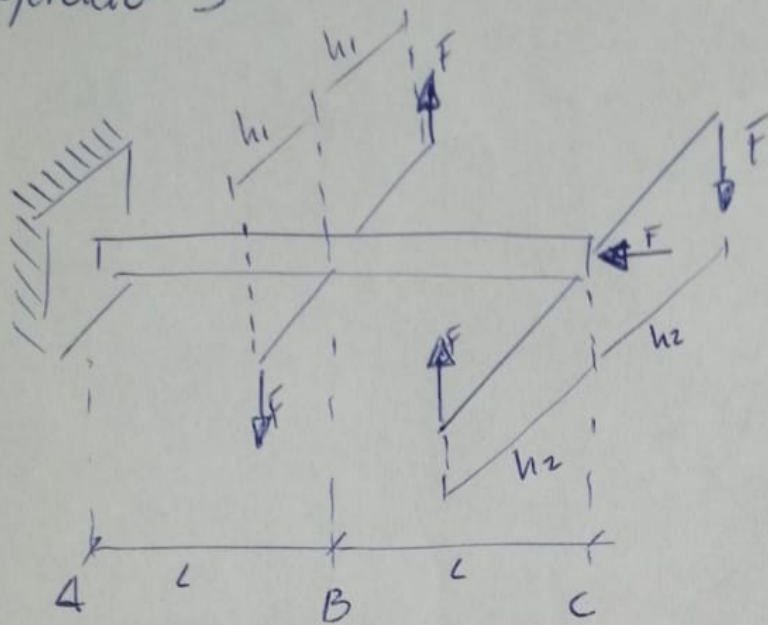
2)b)



$\tau_{\text{Max}} = T/2A = 2.6 \text{ MPa}$

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Ejercicio 3



$$F = 1500 \text{ N}$$

$$D = 2''$$

$$e = 3/16''$$

$$L = 75 \text{ cm}$$

$$h_1 = 20 \text{ cm}$$

$$h_2 = 45 \text{ cm}$$

$$A = 4\pi (D^2 - (D - 2e)^2) = 0,011 \text{ m}^2$$

$$J = \frac{\pi (D^4 - (D - 2e)^4)}{32} = 3,69 \times 10^{-4} \text{ m}^4$$

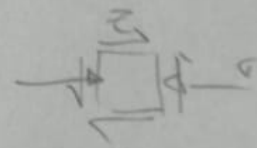
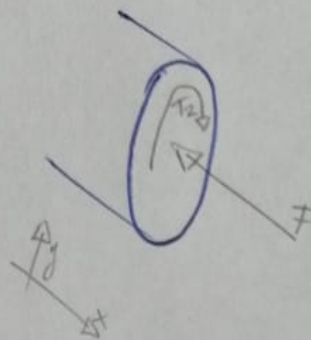
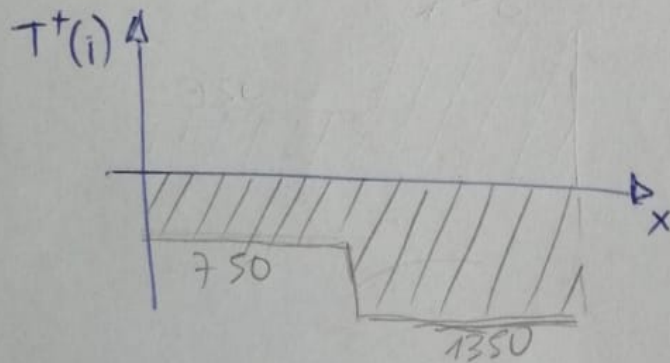
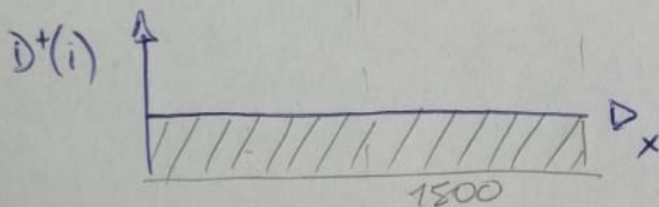
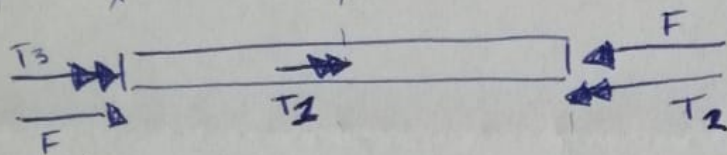
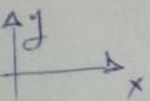
$$T_1 = 2F \cdot h_1 = 600 \text{ Nm}$$

$$T_2 = 2F \cdot h_2 = 1350 \text{ Nm}$$

$$\sum \Pi_x = 0 \Rightarrow T_3 = T_2 - T_1$$

$$T_3 = 750 \text{ Nm}$$

Las secciones más comprometidas son todas aquellas entre B y C.



$$\tau = F/A = 0,136 \text{ MPa}$$

$$\epsilon = \frac{T D}{2J} = 92,9 \text{ MPa}$$

$$\epsilon_{max} = \sqrt{\left(\frac{\tau}{2}\right)^2 + \epsilon^2}$$

$$\epsilon_{max} = 92,9 \text{ MPa}$$

