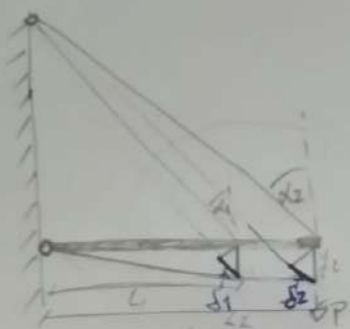


Ejercicio 4.6/

Estiramiento de barras

$$\delta = \frac{F \cdot L}{EA} \quad (\text{Ec. 1})$$

- $\alpha_1 = 45^\circ$
- $\alpha_2 = 60^\circ$
- $L_1 = 1 \text{ m}$
- $L_2 = 1,732 \text{ m}$
- $L_0 = 1,414 \text{ m}$
- $L_c = 2 \text{ m}$
- $P = 8 \text{ kN}$



→ Triángulos semejantes:  $\frac{\delta_2}{L_2} = \frac{\delta_1}{L_1}$

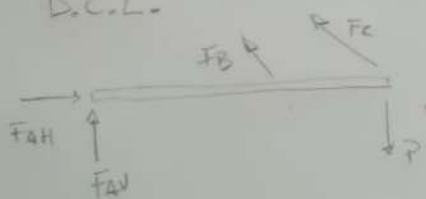
Condición de deformación

$$\frac{\delta_1}{L_1 \cos(\alpha_1)} = \frac{\delta_2}{L_2 \cos(\alpha_2)} \quad (\text{Ec. 2})$$



$$\delta \cos(\alpha) = \delta_1$$

D.C.L.



$$\sum F_x = 0: F_{AH} = F_B \cdot \text{sen}(\alpha_1) + F_C \cdot \text{sen}(\alpha_2) \quad (\text{Ec. 3})$$

$$\sum F_y = 0: F_{AV} + F_B \cos(\alpha_1) + F_C \cos(\alpha_2) = P \quad (\text{Ec. 4})$$

$$\sum \text{M} = 0: L_1 \cdot F_B \cdot \cos(\alpha_1) + L_2 \cdot F_C \cdot \cos(\alpha_2) = L_2 \cdot P \quad (\text{Ec. 5})$$



[Ec.1 en Ec.2] 
$$\frac{F_B \cdot L_B}{EA \cdot L_1 \cdot \cos(\alpha_1)} = \frac{F_C \cdot L_C}{EA \cdot L_2 \cdot \cos(\alpha_2)} \Rightarrow \frac{F_B L_B \cos(\alpha_2) L_2}{L_1 \cos(\alpha_1) \cdot L_C} = F_C \quad (Ec.6)$$

Incógnitas:  $\{ F_{AH}, F_{AV}, F_B, F_C \}$  }  $4 \times 4$   
 Ecuaciones:  $\{ 3, 4, 5, 6 \}$

$\Rightarrow$  [Ec.6 en Ec.5]  $\Rightarrow \left( L_1 \cdot \cos(\alpha_1) + L_2 \cdot \cos(\alpha_2) \cdot \frac{L_B \cdot \cos(\alpha_2) L_2}{L_1 \cos(\alpha_1) L_C} \right) F_B = L_2 \cdot P \rightarrow F_B = 9,51 \text{ kN}$

$\downarrow$  [Ec.6]

$F_C = 8,23 \text{ kN}$

Además, si quisiera calcular las reacciones en A, uso las Ecs 3 y 4.

