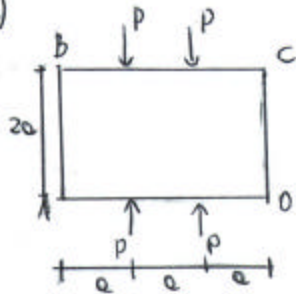


Pauta Ejercicio 7

a)

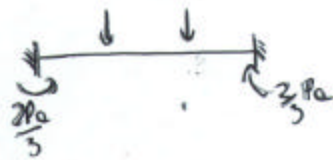


Utilizando simetría se sabe que:

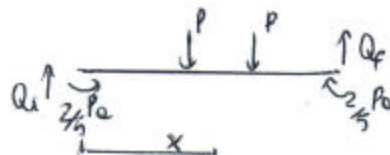
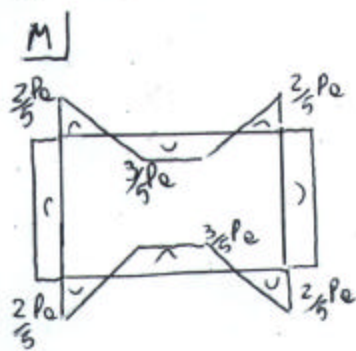
- Rigidez por barra que pasa por un eje de simetría: $\frac{I}{2L}$

- Factor de transporte = 0

$$F_{BC} = \frac{\frac{I}{6a}}{\frac{I}{6a} + \frac{I}{4a}} = \frac{\frac{1}{6}}{\frac{5}{12}} = \frac{2}{5} \Rightarrow F_{BA} = 1 - \frac{2}{5} = \frac{3}{5}$$



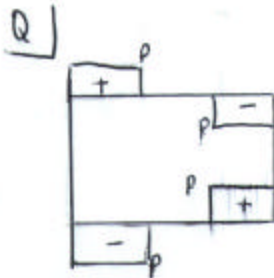
	BA	BC	
FD	3/5	2/5	$\times Pa$
M_{emp}	0	2/3	$\times Pa$
	-2/5	-4/5	$\times Pa$
Σ	-2/5	2/5	$\times Pa$



$$\Sigma M_A: Q_f \cdot 3a - \frac{2}{5}Pa - 2aP - aP + \frac{2}{5}Pa = 0$$

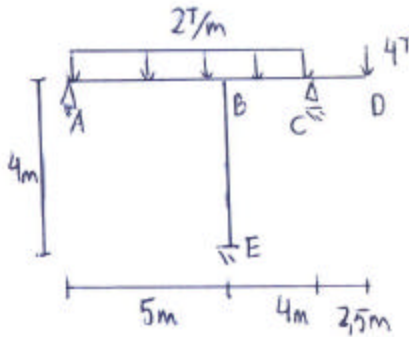
$$Q_f = P$$

$$M(x) = -P(x-a) - \frac{2}{5}Pa + Px = \frac{3}{5}Pa$$

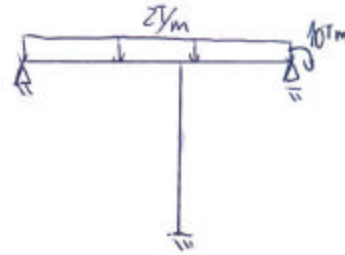


Prova exercício 7

b)



⇒

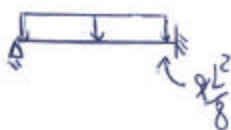


$$F_{BA} = \frac{\frac{3}{4} \cdot \frac{1}{5}}{\frac{3}{4} \cdot \frac{1}{5} + \frac{3}{4} \cdot \frac{1}{4} + \frac{1}{4}} = \frac{\frac{3}{20}}{\frac{47}{80}} = \frac{12}{47}$$

$$F_{BE} = \frac{\frac{1}{4}}{\frac{47}{80}} = \frac{20}{47}$$

$$F_{BC} = \frac{\frac{3}{4} \cdot \frac{1}{4}}{\frac{47}{80}} = \frac{\frac{3}{16}}{\frac{47}{80}} = \frac{15}{47}$$

$$F_{BA} + F_{BE} + F_{BC} = 1$$

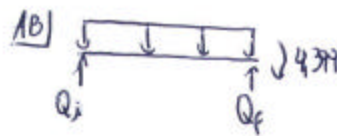
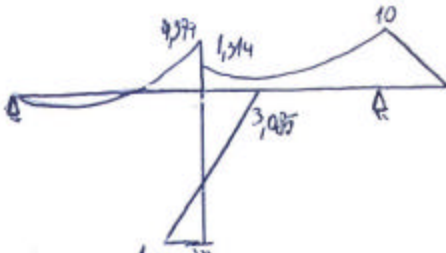


$$\Rightarrow M_{imp\ BA} = -2 \times \frac{25}{8} = -\frac{25}{4} = -6,25 \text{ TM}$$

$$M_{imp\ BC} = \frac{2 \times 16}{8} = 4 \text{ TM}$$

Mext	BA	BE	BC	-10	
FD	12/47	20/47	15/47	1	
Mimp	-6,25	0	4		
	1,851	3,085	2,314	-5	
Σ	-4,399	3,085	+1,314	-10	1543

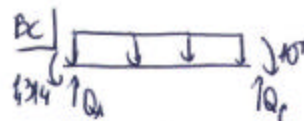
M



$$\sum M_i: Q_f \cdot 5 - 4,399 - \frac{2 \cdot 25}{2} = 1$$

$$Q_f = 5,88 \text{ T}$$

$$\Rightarrow Q_a = 4,12 \text{ T}$$



$$\sum M_i: Q_f \cdot 4 - 10 + 1,314 - \frac{2 \cdot 16}{2} = 0$$

$$Q_f = 6,17 \text{ T} \Rightarrow Q_a = 1,83 \text{ T}$$

Q

