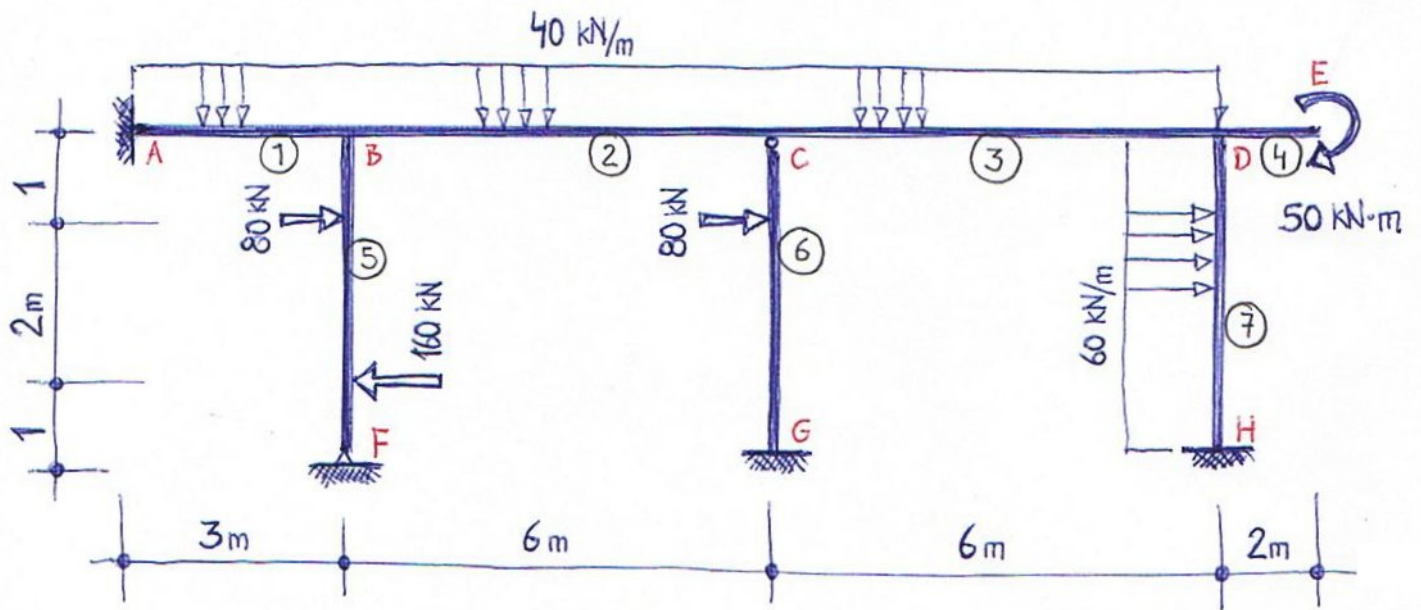


EJERCICIO - 02



$EI = 20 \text{ kN} \cdot \text{m}^2$ EN TODAS LAS BARRAS.

DIBUJAR DIAGRAMA MOMENTO FLECTOR (ACOTAR VALORES REPRESENTATIVOS)

DETERMINAR FLECHA EN PUNTO-E, EL EXTREMO DEL VOLADIZO.



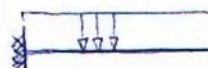





- | | | | | |
|---|-------------------|------|--------------------------------|-------------|
| ① | $L_1 = 3\text{m}$ | EI | $K_1 = 4EI/L = \frac{4}{3} EI$ | $t_1 = 1/2$ |
| ② | $L_2 = 6\text{m}$ | EI | $K_2 = 4EI/L = \frac{4}{6} EI$ | $t_2 = 1/2$ |
| ③ | $L_3 = 6\text{m}$ | EI | " " | $t_3 = 1/2$ |
| ④ | $L_4 = 2\text{m}$ | EI | $K_4 = 0$ | |
| ⑤ | $L_5 = 4\text{m}$ | EI | $K_5 = 3EI/L = \frac{3}{4} EI$ | $t_5 = 0$ |
| ⑥ | $L_6 = 4\text{m}$ | EI | $K_6 = \text{" "}$ | $t_6 = 0$ |
| ⑦ | $L_7 = 4\text{m}$ | EI | $K_7 = 4EI/L = EI$ | $t_7 = 1/2$ |

■ COEFICIENTES DE REPARTO

COEF. REPARTO NUDO-B	$\left\{ \begin{array}{l} CD_1 = \frac{k_1}{k_1+k_2+k_5} = 0'485 \\ CD_2 = \frac{k_2}{k_1+k_2+k_5} = 0'242 \\ CD_5 = \frac{k_5}{k_1+k_2+k_5} = 0'273 \end{array} \right.$	$\left\{ \begin{array}{l} CD_2 = \frac{k_2}{k_2+k_3} = 0'50 \\ CD_3 = \frac{k_3}{k_2+k_3} = 0'50 \\ CD_6 = 0 \text{ (ROTULA)} \end{array} \right.$
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NUDO-D	$\left\{ \begin{array}{l} CD_3 = \frac{k_3}{k_3+k_7} = 0'40 \\ CD_4 = 0 \text{ (VOLADIZO)} \\ CD_7 = \frac{k_7}{k_3+k_7} = 0'60 \end{array} \right.$
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■ MOMENTOS DE EMPOTRAMIENTO PERFECTO

- | | | | |
|----|---|---|---|
| ① |  | $M = qL^2/12 = 30 \text{ KN}\cdot\text{m}$ |  |
| ②③ |  | $M = qL^2/12 = 120 \text{ KN}\cdot\text{m}$ |  |
| ④ |  | $M = M = 50 \text{ KN}\cdot\text{m}$ |  |
| ⑤ |  | $M = \sum \left[\frac{qb}{2L^2} (L^2 - b^2) \right] = -525 + 75 = 225 \text{ KN}\cdot\text{m}$ |  |

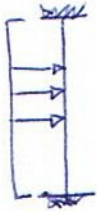
6



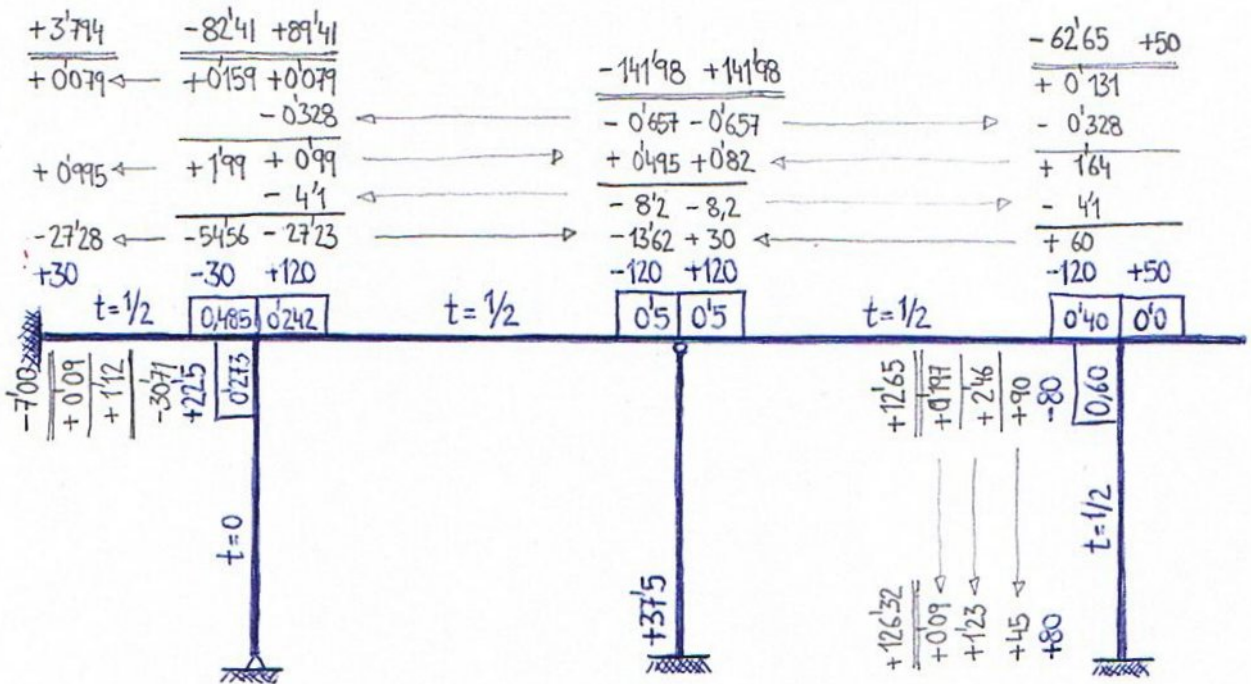
$$M = \frac{qb}{2L^2} (L^2 - b^2) = 37.5 \text{ kN}\cdot\text{m}$$



7

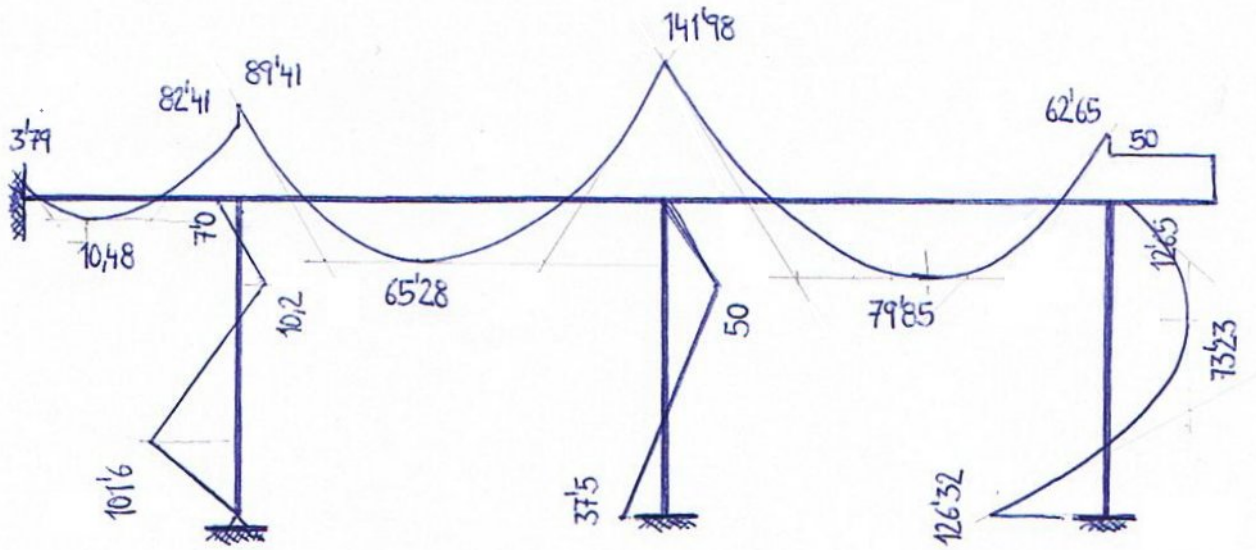


$$M = \frac{qL^2}{12} = 80 \text{ kN}\cdot\text{m}$$

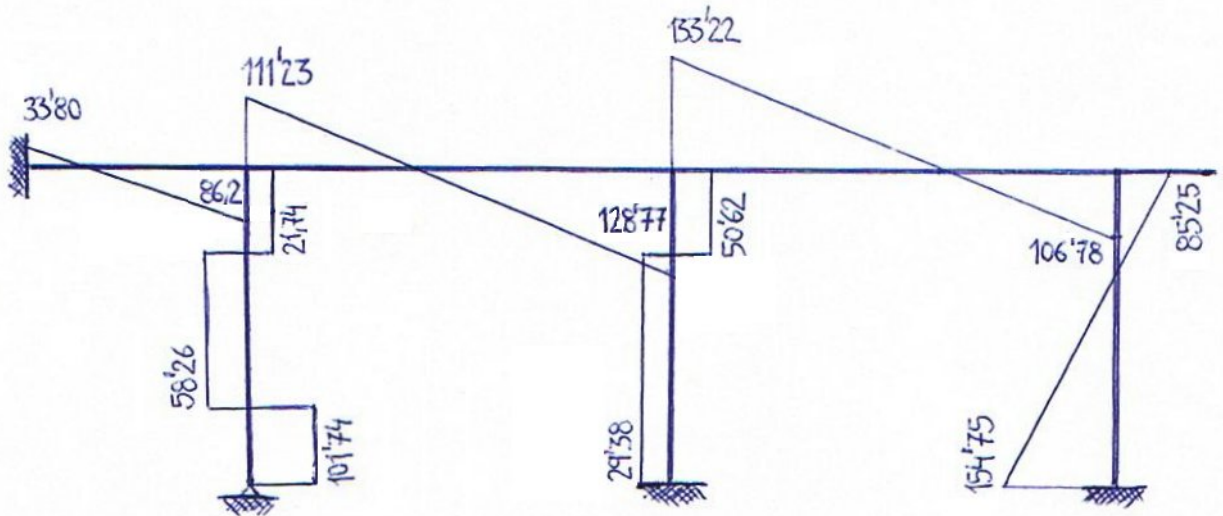


ORDEN DE DISTRIBUCIÓN MOMENTOS = NUDO CON DESEQUILIBRIO MAYOR EN CADA OCASIÓN.

■ DIAGRAMAS DE ESFUERZOS



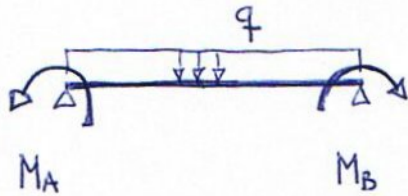
MOMENTO FLECTOR [KN·m]



ESFUERZO CORTANTE [KN]

■ FLECHA EN EL EXTREMO DEL VOLADIZO (PUNTO-E)

1° ESTUDIO GIRO NUDO D



$$\theta_B = \frac{M_A L}{6EI} + \frac{M_B L}{3EI} - \frac{qL^3}{24EI}$$

2° ESTUDIO DEL VOLADIZO

