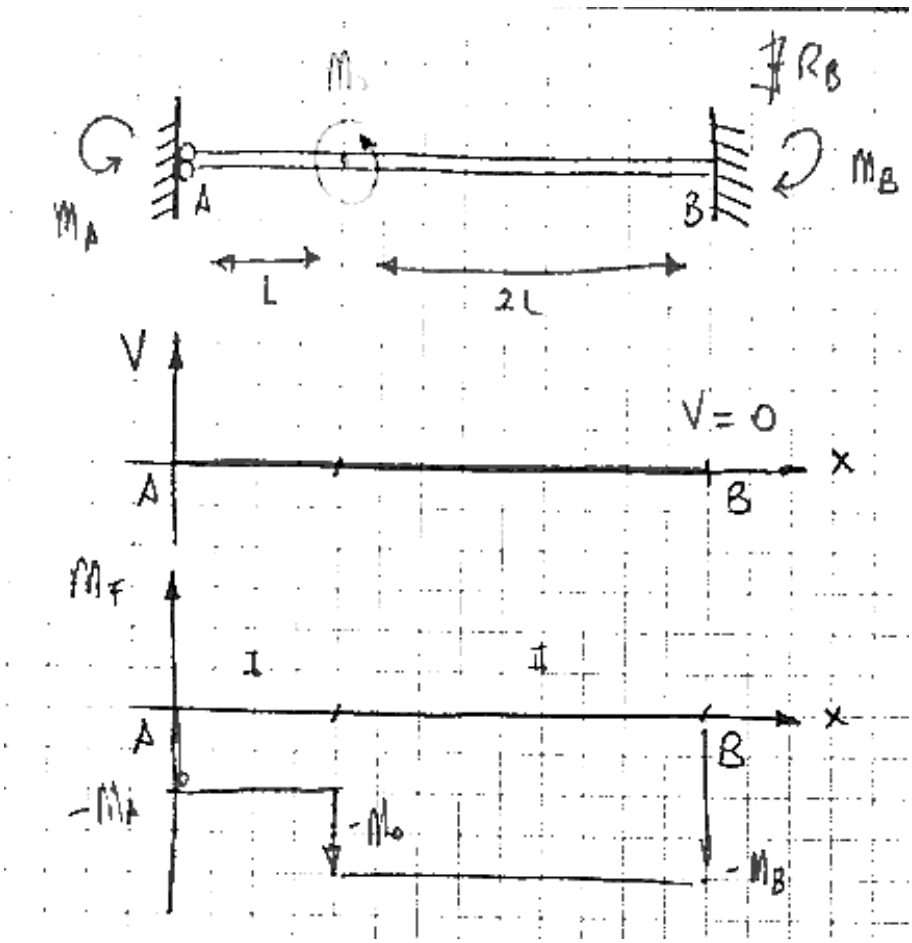


a) $n = 1$

b) $\nexists R_A, R_B \leftrightarrow \nexists \int_y^{ext} \rightarrow V = 0 \quad \forall x$

$\sum M_A^{ext} = 0 \rightarrow +M_A + M_0 - M_B = 0 \rightarrow M_B = M_A + M_0$

$M_I(0) = -M_A$

M_A

$M_f = -M_A$

$M_f(x) = cte = -M_A$

→ Método I: Integración

(T1) $EI_z v_I'' = -M_A \rightarrow EI_z v_I' = -M_A x + C_1 \rightarrow EI_z v_I = -M_A \frac{x^2}{2} + C_1 x + D_1$

(T2) $EI_z v_{II}'' = -M_0 - M_A \rightarrow EI_z v_{II}' = -(M_0 + M_A)x + C_2 \rightarrow EI_z v_{II} = -(M_0 + M_A)\frac{x^2}{2} + C_2 x + D_2$

5 CC

✓ $\theta_A = 0 = v_I'(0) \rightarrow \boxed{C_1 = 0}$

✓ $\theta_B = 0 = v_{II}'(3L) \rightarrow \boxed{C_2 = (M_0 + M_A)3L}$

$v_I(L) = v_{II}(L)$

$v_I'(L) = v_{II}'(L)$

✓ $v_{II}(3L) = 0$ →

$$-M_A\frac{L^2}{2} + D_1 = -(M_0+M_A)\frac{L^2}{2} + (M_0+M_A)3L^2 - (M_0+M_A)\frac{9L^2}{2}$$

$$D_1 = (M_0+M_A)L^2\left[-\frac{1}{2} + 3 - \frac{9}{2}\right] + M_A\frac{L^2}{2} = -M_0 2L^2 + M_A L^2\left[\frac{1}{2} - 2\right]$$

$\frac{-1+6-9}{2} = -2$; $\frac{-3}{2}$

• $v_{II}(3L) = 0 \rightarrow -(M_0+M_A)\frac{9L^2}{2} + (M_0+M_A)(3L)^2 + D_2$

$$D_2 = -(M_0+M_A)\frac{9L^2}{2}$$

$$-M_A + M_A - 3M_A = -M_0 + 3M_0 = 2M_0$$

$$M_A = -2M_0$$

→ Método II Mohr-Bres

$$\frac{\partial U}{\partial M_A} = 0 \quad \text{como } U = U_1 + U_2 \rightarrow \frac{\partial U_1}{\partial M_A} + \frac{\partial U_2}{\partial M_A} = 0$$

$$\frac{\partial U_1}{\partial M_A} = \int_0^L \frac{M_I(x)}{EI_z} \cdot \frac{\partial M_I}{\partial M_A} dx = \int_0^L + \frac{M_A}{EI_z} dx = \frac{M_A}{EI_z} L$$

$$\frac{\partial U_2}{\partial M_A} = \int_L^{3L} \frac{M_{II}(x)}{EI_z} \frac{\partial M_{II}}{\partial M_A} dx = \frac{(M_A + M_0)}{EI_z} (3L - L)$$

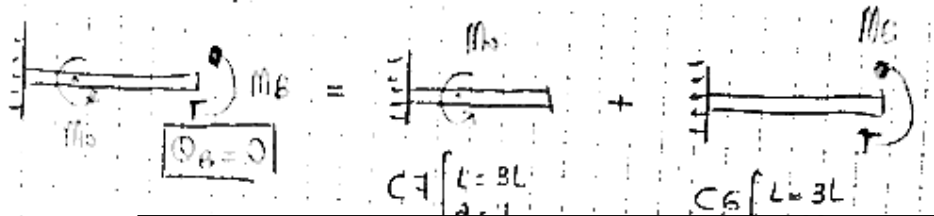
($\frac{\partial M_{II}}{\partial M_A} = -1$; $2L$)

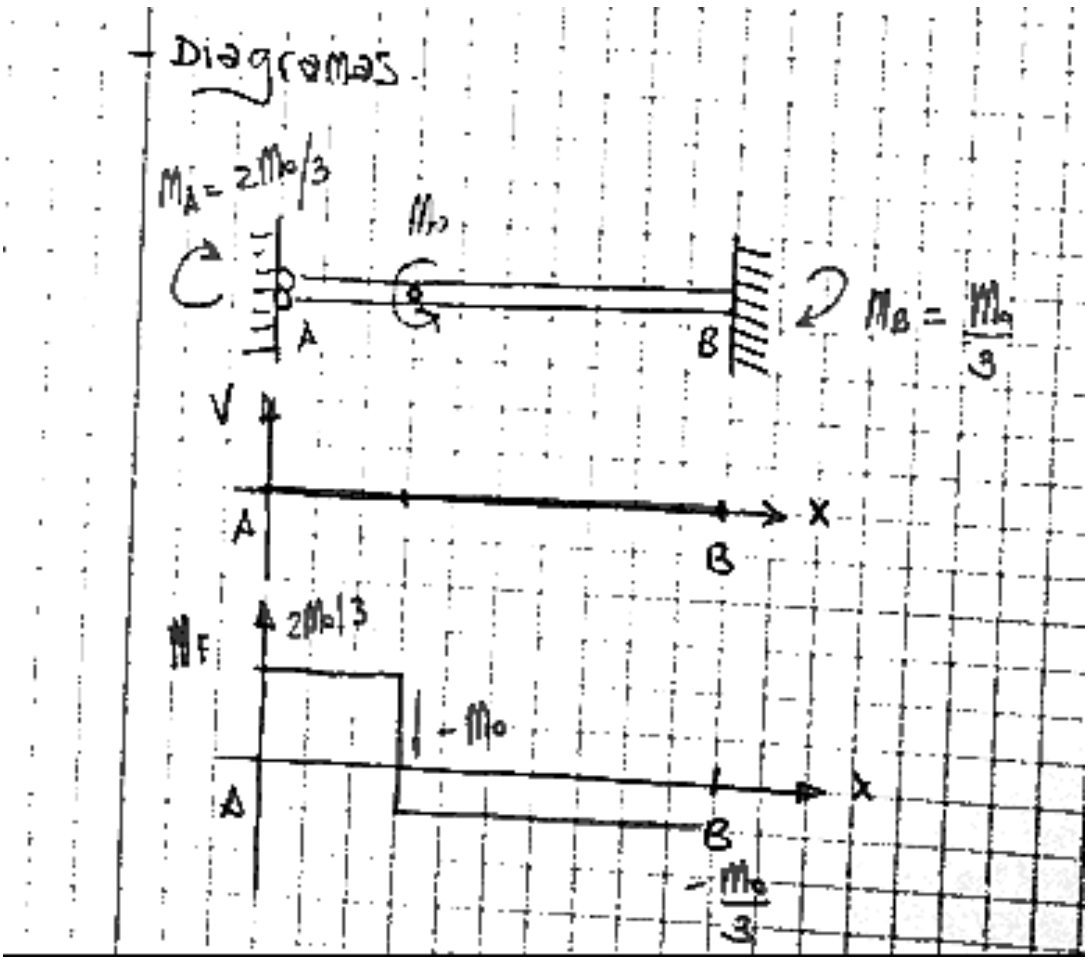
$$\frac{M_A L}{EI_z} + \frac{(M_A + M_0) 2L}{EI_z} = 0 \rightarrow 3M_A + 2M_0 = 0$$

$$\frac{3-2}{3} = \frac{M_0}{3} \quad \boxed{M_A = -\frac{2}{3} M_0}$$

↳ E.E. → $M_B = M_A + M_0 = \left(1 - \frac{2}{3}\right) M_0 \rightarrow \boxed{M_B = \frac{M_0}{3}}$

→ Método III: Superposición.





$$V_1 = -\frac{\frac{2}{3}M_0}{2}\frac{x^2}{2} - 2M_0 L^2 - \frac{3}{2}\frac{\frac{2}{3}M_0}{2}L^2 = \frac{2}{3}\frac{M_0}{2}\frac{x^2}{2} - 2M_0 L^2 + M_0 L^2$$

$$V_1' = \frac{2}{6}M_0 x$$

$-M_0 L^2$