

Equilibrio

$$\sum M_{(D)} = 0 \quad 2M_0 + H_E L = 0 \quad H_E = -\frac{2M_0}{L}$$

$$\sum M_{(C)} = 0 \quad M_0 + H_E L + V_E \cdot \frac{L}{2} - 2M_0 = 0$$

$$M_0 - 2M_0 + V_E \cdot \frac{L}{2} - 2M_0 = 0$$

$$V_E \cdot \frac{L}{2} - 3M_0 = 0 \quad V_E = +\frac{6M_0}{L}$$

$$\rightarrow R_x = 0 \quad H_A + \frac{8M_0}{3L} + H_E = 0$$

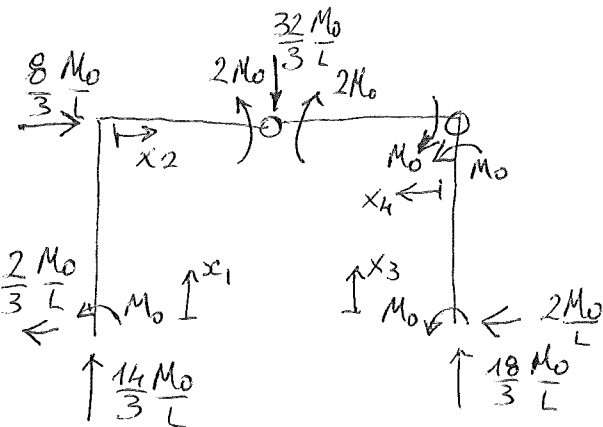
$$H_A + \frac{8M_0}{3L} - \frac{2M_0}{L} = 0$$

$$H_A + \frac{8-6M_0}{3L} = 0 \quad H_A = -\frac{2M_0}{3L}$$

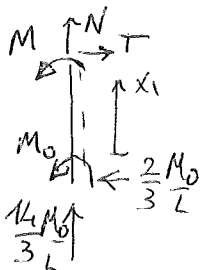
$$\uparrow R_y = 0 \quad V_A - \frac{32M_0}{3L} + V_E = 0$$

$$V_A - \frac{32M_0}{3L} + \frac{18M_0}{3L} = 0$$

$$V_A - \frac{32-18M_0}{3L} = 0 \quad V_A = \frac{14M_0}{3L}$$



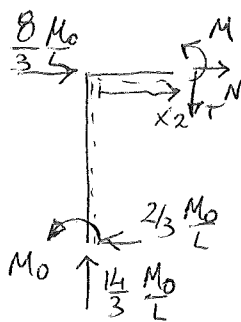
$0 \leq x_1 \leq L$



$$N(x_1) = -\frac{14M_0}{3L}$$

$$T(x_1) = \frac{2M_0}{3L}$$

$$M(x_1) = -M_0 + \frac{2M_0 x_1}{3L}$$



$0 \leq x_2 < \frac{L}{2}$

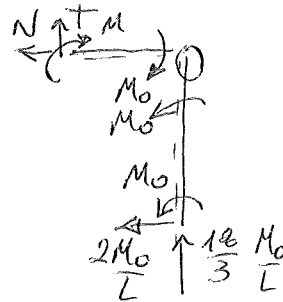
$$N(x_2) = -\frac{6M_0}{3L} = -\frac{2M_0}{L}$$

$$T(x_2) = \frac{14M_0}{3L}$$

$$M(x_2) = -M_0 + \frac{2M_0}{3} + \frac{14M_0 x_2}{3L}$$

$$M(x_2) = -\frac{M_0}{3} + \frac{14M_0 x_2}{3L}$$

$0 \leq x_4 < \frac{L}{2}$



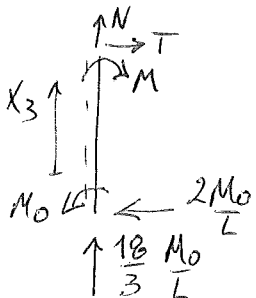
$$N(x_4) = -\frac{2M_0}{L}$$

$$T(x_4) = -\frac{18M_0}{3L} = -\frac{6M_0}{L}$$

$$M(x_4) = M_0 - 2M_0 + \frac{18M_0 x_4}{3L}$$

$$M(x_4) = -M_0 + 6M_0 \frac{x_4}{L}$$

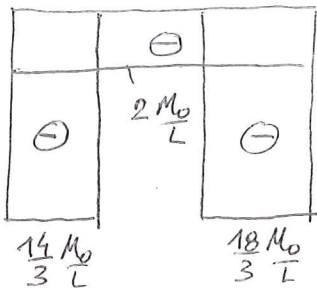
$0 \leq x_3 \leq L$



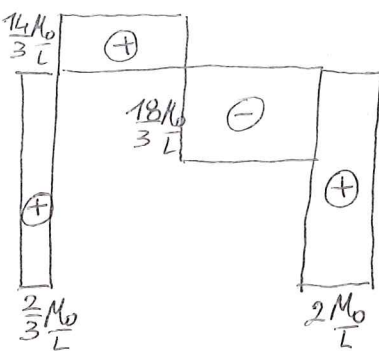
$$N(x_3) = -\frac{6M_0}{L}$$

$$T(x_3) = \frac{2M_0}{3L}$$

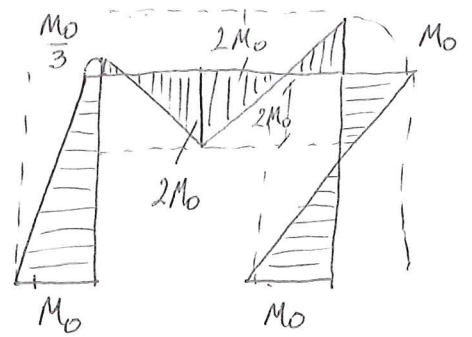
$$M(x_3) = M_0 - \frac{2M_0 x_3}{L}$$



$N \leftarrow \boxed{+} \rightarrow$

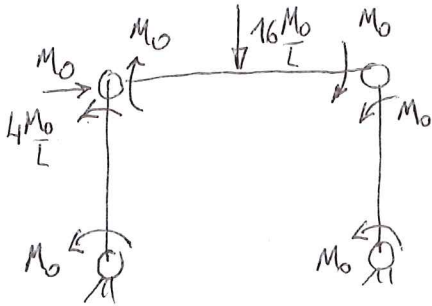


$T \uparrow \downarrow$



$M \left(\square \right)$

ALTRO ESEMPIO



Equilibrio

$$\uparrow M_{(D)}^{(3)} = 0 \quad 2M_0 + H_E \cdot L = 0 \quad H_E = -\frac{2M_0}{L}$$

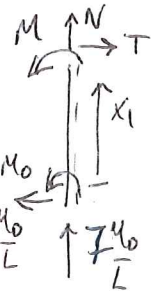
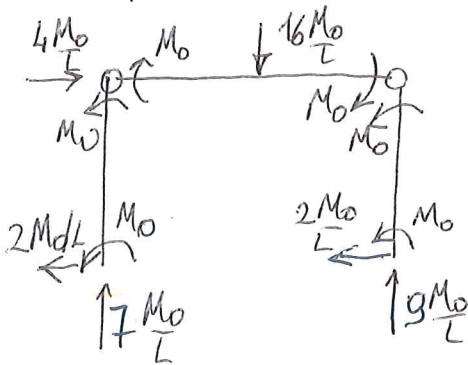
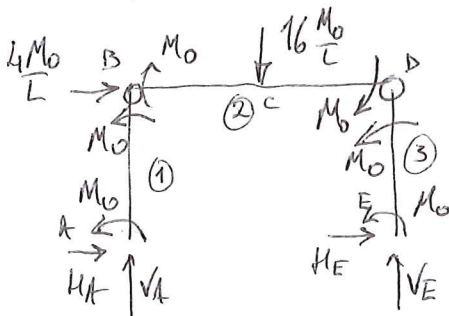
$$\uparrow M_{(B)}^{(2)} = 0 \quad M_0 + (H_E L) + V_E \cdot L - 16 \frac{M_0}{L} \cdot \frac{L}{2} = 0$$

$$M_0 - 2M_0 + V_E \cdot L - 8M_0 = 0$$

$$V_E \cdot L - 9M_0 = 0 \quad V_E = \frac{9M_0}{L}$$

$$\rightarrow R_x = 0 \quad H_A + 4 \frac{M_0}{L} + H_E = 0 \quad H_A = -\frac{2M_0}{L}$$

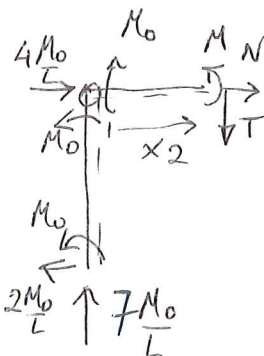
$$\uparrow R_y = 0 \quad V_A - 16 \frac{M_0}{L} + V_E = 0 \quad V_A = 7 \frac{M_0}{L}$$



$$N(x_1) = -7 \frac{M_0}{L}$$

$$T(x_1) = 2 \frac{M_0}{L}$$

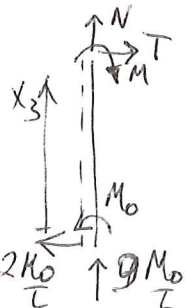
$$M(x_1) = -M_0 + 2M_0 \frac{x_1}{L}$$



$$N(x_2) = -2 \frac{M_0}{L}$$

$$T(x_2) = 7 \frac{M_0}{L}$$

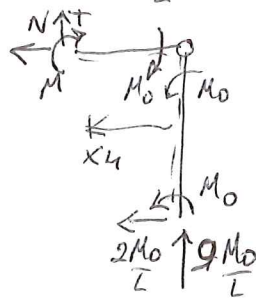
$$M(x_2) = -M_0 + 2M_0 + 7 \frac{M_0 x_2}{L} = M_0 + 7M_0 \frac{x_2}{L}$$



$$N(x_3) = -9 \frac{M_0}{L}$$

$$T(x_3) = 2 \frac{M_0}{L}$$

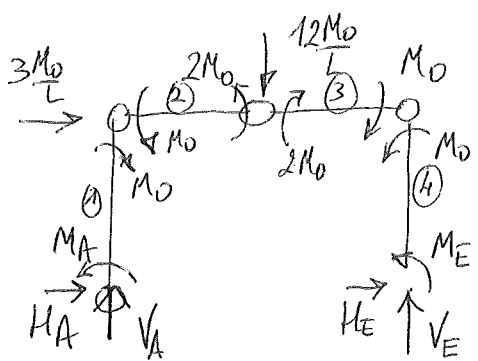
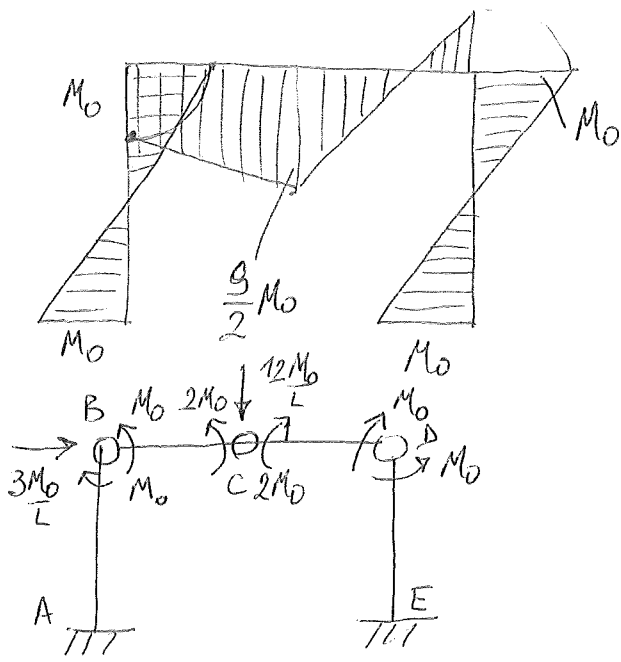
$$M(x_3) = M_0 - 2M_0 \frac{x_3}{L}$$



$$N(x_4) = -2 \frac{M_0}{L}$$

$$T(x_4) = -9 \frac{M_0}{L}$$

$$M(x_4) = M_0 - 2M_0 + 9M_0 \frac{x_4}{L} = -M_0 + 9M_0 \frac{x_4}{L}$$



Equilibrio

$$\sum M_{(D)} = 0 \quad H_E \cdot L + M_E + M_0 = 0 \quad H_E = -\frac{(M_E + M_0)}{L}$$

$$\sum M_{(C)} = 0 \quad H_E \cdot L + V_E \cdot \frac{L}{2} + M_E - 2M_0 = 0 \quad [*]$$

$$\sum M_{(B)} = 0 \quad H_A \cdot L + M_A + 2M_0 - V_A \cdot \frac{L}{2} = 0 \quad [**]$$

$$\sum M_{(A)} = 0 \quad H_A \cdot L + M_A - M_0 = 0 \quad H_A = \frac{M_0 - M_A}{L}$$

$$R_x = 0 \quad \frac{M_0}{L} - \frac{M_A}{L} - \frac{M_E}{L} - \frac{M_0}{L} + 3\frac{M_0}{L} = 0$$

$$M_A + M_E = 3M_0$$

Se $M_E = 0$ $M_A = 3M_0$ viola compatibilità

Se $M_A = 0$ $M_E = 3M_0$ viola compatibilità

$$\sum M_{(A)} = 0 \quad M_A = 3M_0 - 6M_0 + M_E + 6M_0$$

$$M_A + M_E = 3M_0$$

$$[*] \quad V_E \cdot \frac{L}{2} - 3M_0 = 0 \quad V_E = 6\frac{M_0}{L}$$

$$[**] \quad 3M_0 - V_A \cdot \frac{L}{2} = 0 \quad V_A = 6\frac{M_0}{L}$$