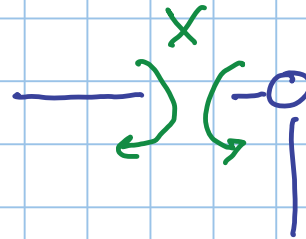


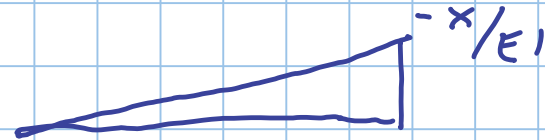
$$\varphi_{C, \text{sin}} = \varphi_{C, \text{des}}$$

$$\varphi_+$$

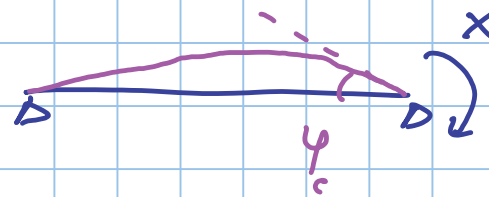
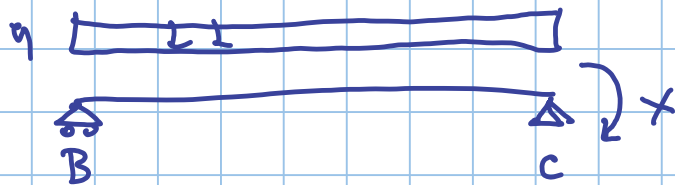


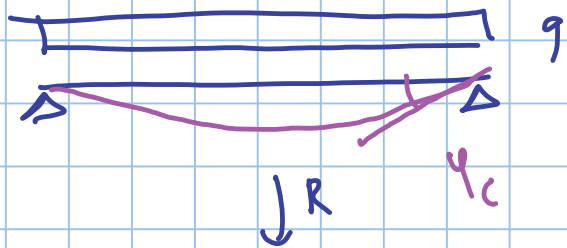
$$\varphi_{C, \text{sin}}$$

M

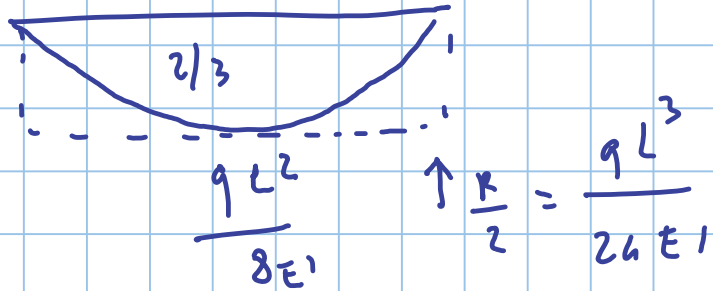


$$\Rightarrow \varphi_c = -\frac{XL}{3(EI)}$$



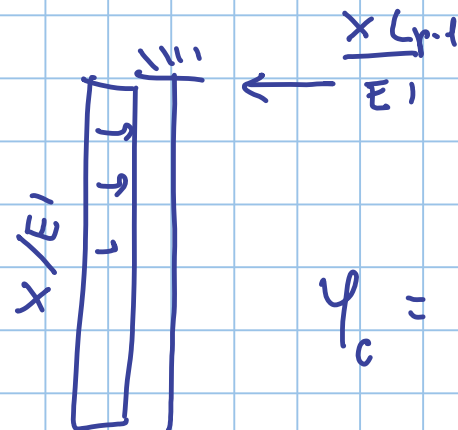
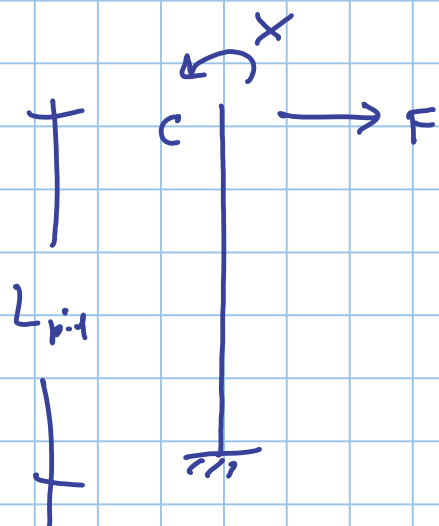


$$\Rightarrow \varphi_c = \frac{qL^3}{24(EI)_{\text{trc}}}$$



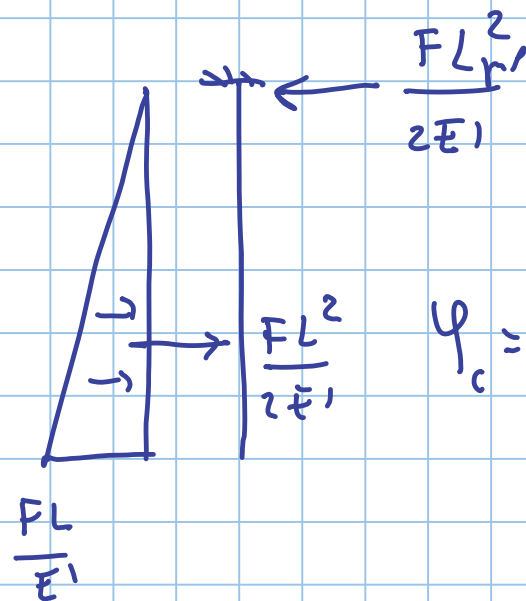
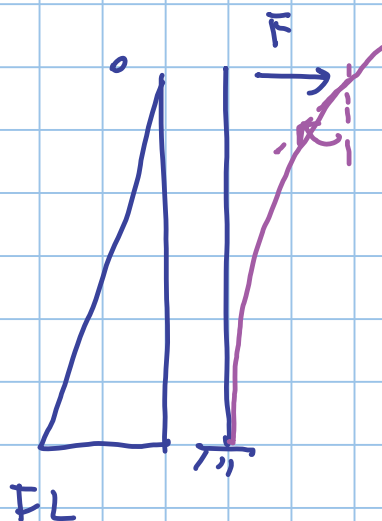
$$R = \frac{qL^2}{8EI} \cdot L \cdot \frac{2}{3} = \frac{qL^3}{12EI}$$

$$\varphi_{c, \text{st}} = -\frac{XL}{3EI} + \frac{qL^3}{24(EI)_{\text{trc}}}$$



$$\varphi_c = \frac{X L_{pi-1}}{(E I)_{pi-1}}$$

$$\varphi_{c, \text{sum}} = \frac{X L_{pi-1}}{E I} - \frac{F L_{pi-1}^2}{2 E I}$$



$$\varphi_c = - \frac{F L_{pi-1}^2}{2 (E I)_{pi-1}}$$

$$\varphi_{c, \text{un}} = -\frac{XL}{3EI} + \frac{qL^3}{24EI}$$

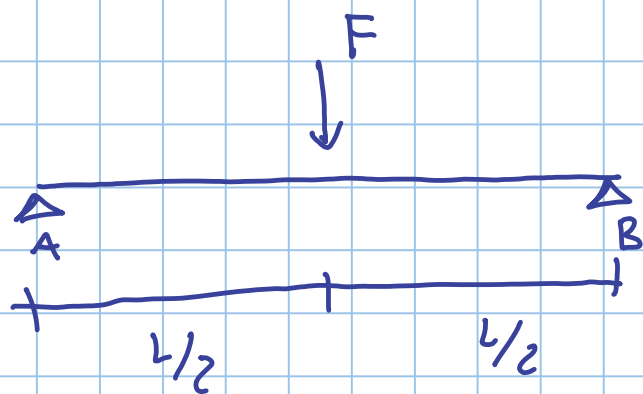
$$\varphi_{c, \text{un}} = \frac{XL}{EI} - \frac{FL^2}{2EI}$$

$$-\frac{XL}{3EI_{\text{un}}} + \frac{qL^3}{24EI_{\text{un}}} = \frac{XL_{\text{un}}}{EI_{\text{un}}} - \frac{FL_{\text{un}}^2}{2EI_{\text{un}}}$$

$$\frac{XL_{\text{un}}}{EI_{\text{un}}} + \frac{XL}{3EI_{\text{un}}} = \frac{qL^3}{24EI_{\text{un}}} + \frac{FL_{\text{un}}^2}{2EI_{\text{un}}}$$

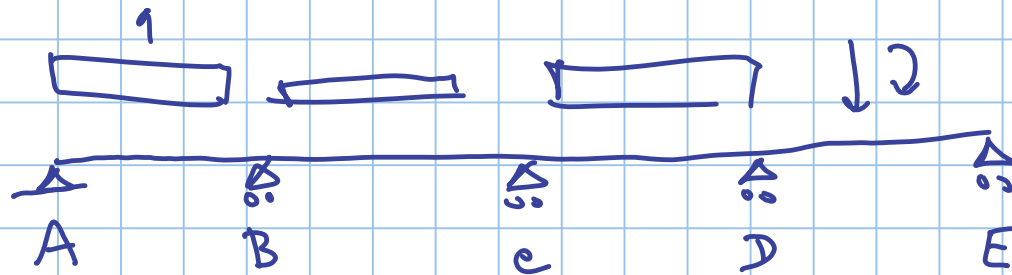
$$\varphi_{c, \text{un}} = \varphi_{c, \text{un}}$$

$$X = \frac{\frac{qL^3}{24EI_{\text{un}}} + \frac{FL_{\text{un}}^2}{2EI_{\text{un}}}}{\frac{L_{\text{un}}}{EI_{\text{un}}} + \frac{L}{3EI_{\text{un}}}}$$



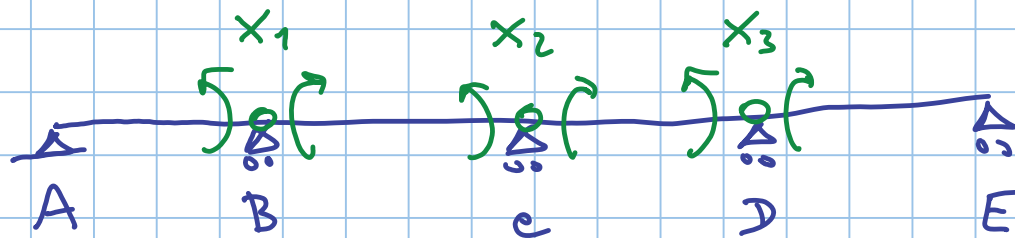
$$\varphi_A = \frac{FL^2}{16EI}$$

TRAVE CONTINUA su pin appoggi



LABILE

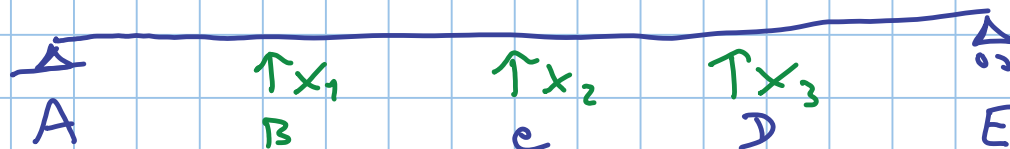
ISOSTATICO



$$\varphi_{B, \text{in}} = \varphi_{C, \text{in}}$$

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$$v_3 = 0$$

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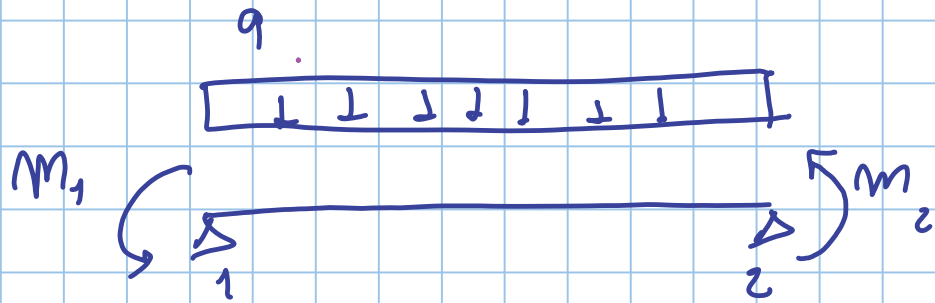
1 IPERST

2 IPERST

3 IPERST

4 "

5 "



$$\varphi_1 = m_1 \frac{l}{3EI} - m_2 \frac{l}{6EI} - \frac{ql^3}{24EI}$$

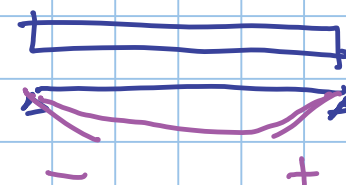
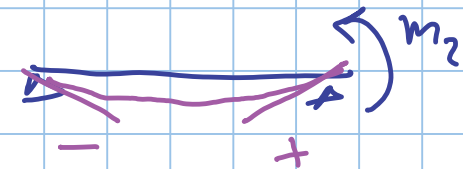
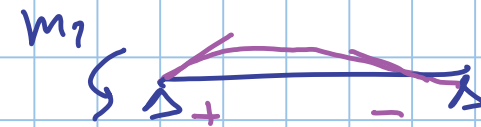
$$\varphi_2 = -m_1 \frac{l}{6EI} + m_2 \frac{l}{3EI} + \frac{ql^3}{24EI}$$

$$\varphi_1 = \alpha_1 m_1 - \beta m_2 + \varphi_1(q)$$

$$\varphi_2 = -\beta m_1 + \alpha_2 m_2 + \varphi_2(q)$$

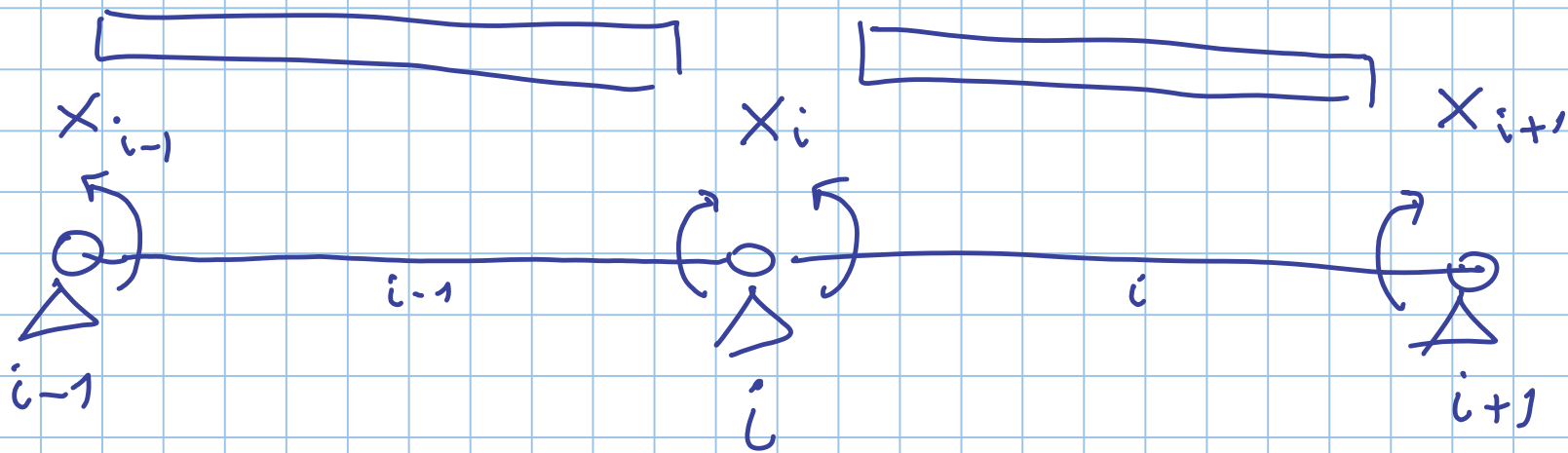
M coppia esterna m^+

M car. roll. $\left(\square \right) m^+$



$$\varphi_{i,an} \rightarrow \varphi_1 = \alpha_1 m_1 - \beta m_2 + \varphi_1(q)$$

$$\varphi_{i,in} \rightarrow \varphi_2 = -\beta m_1 + \alpha_2 m_2 + \varphi_2(q)$$



$$\varphi_{i,in} = -\beta^{i-1} x_{i-1} + \alpha_2^{i-1} (-x_i) + \varphi_2^{i-1}(q)$$

$$\varphi_{i,an} = \alpha_1^i x_i - \beta^i (-x_{i+1}) + \varphi_1^i(q)$$

$$-\beta^{i-1} X_{i-1} + \alpha_2^{i-1} (-X_i) + \varphi_2^{i-1}(q) = \alpha_1^i X_i - \beta^i (-X_{i+1}) + \varphi_1^i(q)$$

$$\beta^{i-1} X_{i-1} + (\alpha_1^i + \alpha_2^{i-1}) X_i + \beta^i X_{i+1} = \varphi_2^{i-1}(q) - \varphi_1^i(q)$$

$$\begin{vmatrix} \alpha_1^2 + \alpha_2^1 & \beta^2 & - & - & - \\ \beta^2 & \alpha_1^3 + \alpha_2^2 & \beta^3 & - & - \\ - & \beta^3 & \text{val} & \text{val} & - \\ - & - & \text{val} & \text{val} & \text{val} \\ - & - & - & \text{val} & \text{val} \end{vmatrix} \begin{vmatrix} X_2 \\ X_3 \\ \vdots \end{vmatrix} = \begin{vmatrix} \varphi_2^1 - \varphi_1^2 \end{vmatrix}$$

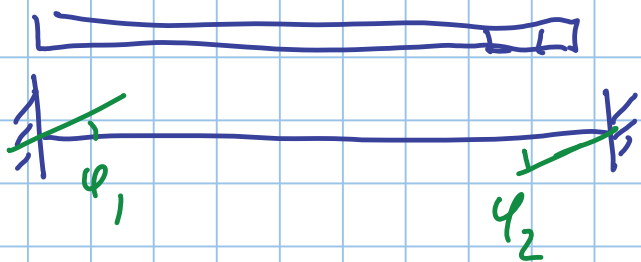
soluzione

TRIANGOLARIZZAZIONE

+

SOSTITUZIONE

ALL'INDIETRO



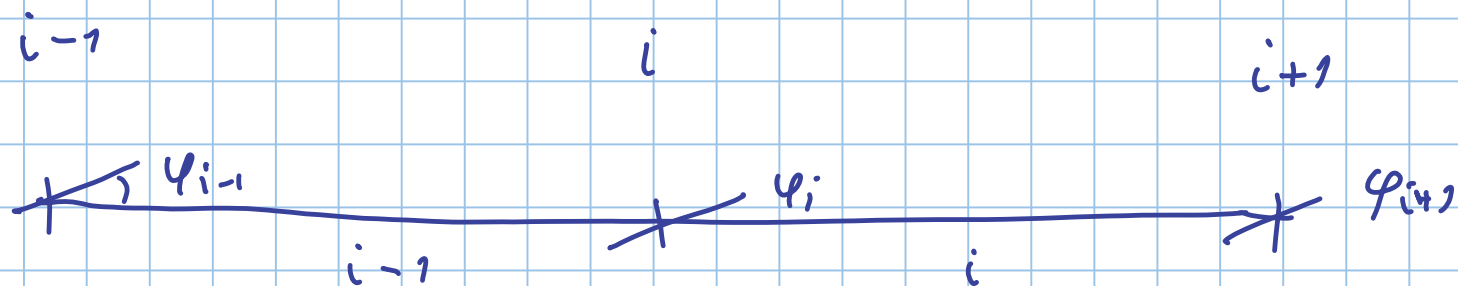
$$\bar{M}_1 = -\frac{q l^2}{12}$$

$$\bar{M}_2 = -\frac{q l^2}{12}$$

$$M_1 = \frac{4EI}{l} \varphi_1 + \frac{2EI}{l} \varphi_2$$

$$M_1 = f_{11} \varphi_1 + f_{12} \varphi_2 + \bar{M}_1(q)$$

$$M_2 = f_{21} \varphi_1 + f_{22} \varphi_2 + \bar{M}_2(q)$$



$$m_{i, \text{in}} + m_{i, \text{out}} = 0$$

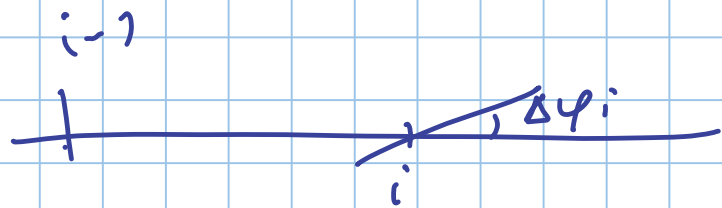
$$m_{i, \text{in}} = \rho_{12}^{i-1} \varphi_{i-1} + \rho_2^{i-1} \varphi_i + \overline{m}_2^{i-1}(\eta)$$

$$m_{i, \text{out}} = \rho_1^i \varphi_i + \rho_{12}^i \varphi_{i+1} + \overline{m}_1^i(\eta)$$

$$\rho_{12}^{i-1} \varphi_{i-1} + (\rho_2^{i-1} + \rho_1^i) \varphi_i + \rho_{12}^i \varphi_{i+1} = -\overline{m}_2^{i-1}(\eta) - \overline{m}_1^i(\eta)$$

\Downarrow $\Delta \varphi_i$ \Downarrow M_{grid}^i

$$\Delta \varphi_i = \frac{M_{\gamma}^i}{\rho_2^{i-1} + \rho_1^i}$$

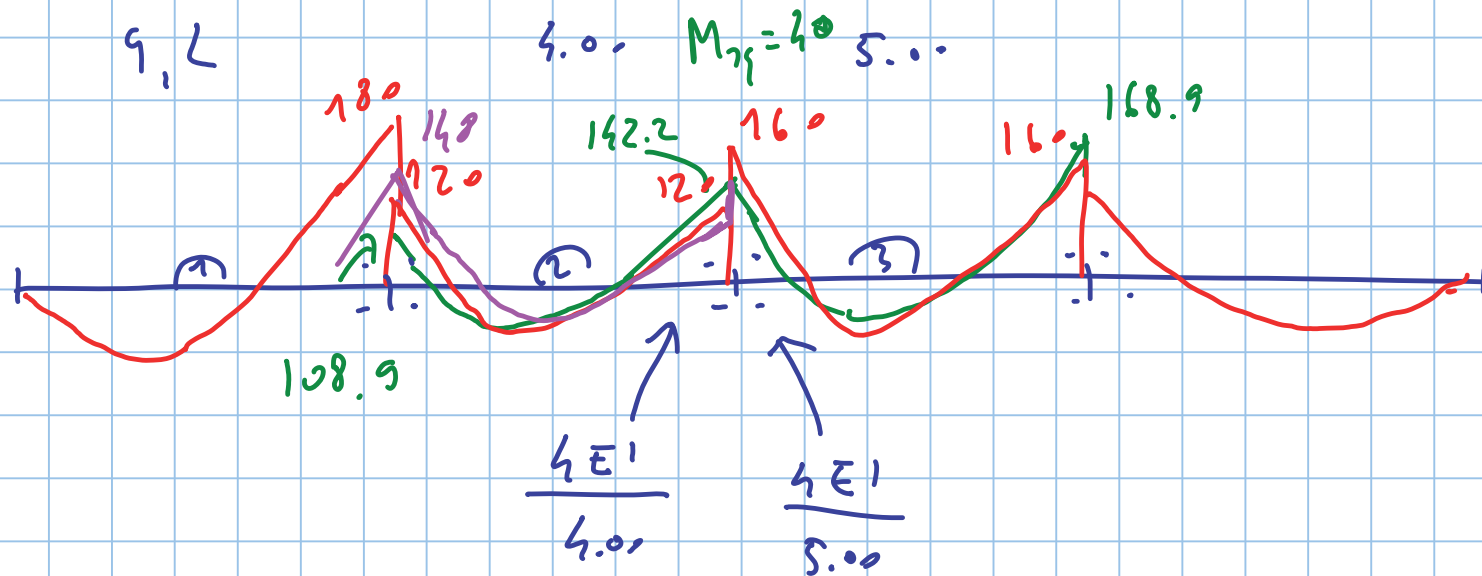


$$\Delta M_{i,\gamma} = \rho_2^{i-1} \Delta \varphi_i = \frac{\rho_2}{\rho_2^{i-1} + \rho_1^i} M_{\gamma}^i$$

$$\Delta M_{i,\alpha} = \rho_1^i \Delta \varphi_i = \frac{\rho_1^i}{\rho_2^{i-1} + \rho_1^i} M_{\gamma}^i$$

$$M_1 = \cancel{\rho_1 \varphi_1} + \rho_{12} \varphi_2$$

$$\Delta M_{i-1} = \rho_{12}^{i-1} \Delta \varphi_i = \left(\frac{\rho_{12}^{i-1}}{\rho_2^{i-1}} \right)^{1/2} \Delta M_{i,\gamma}$$



$$P_1^3 = \left(4 \frac{EI}{L}\right)^3$$

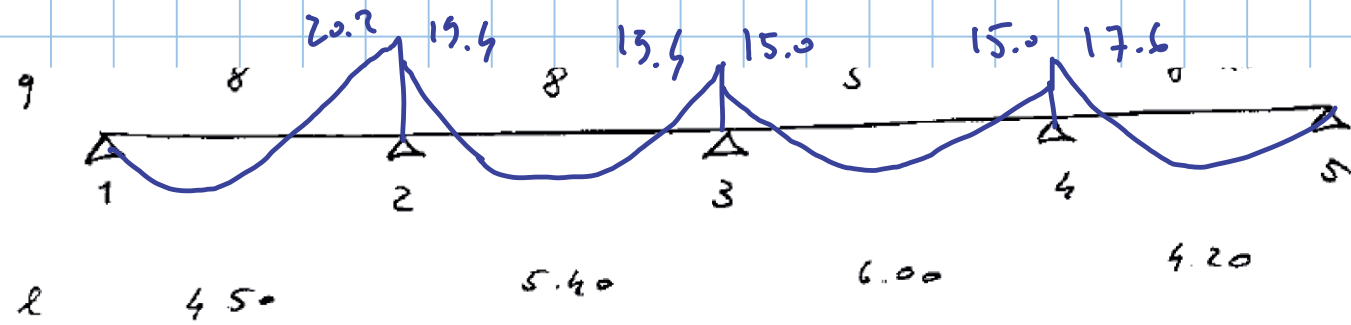
$$P_2^2 = \left(4 \frac{EI}{L}\right)^2$$

22.2
 \uparrow

$0.556 = \frac{0.25(4EI)}{0.45(4EI)}$

17.8
 \uparrow

$\frac{0.20(4EI)}{0.45(4EI)} = 0.444$



METODO 3) $CR = 5$