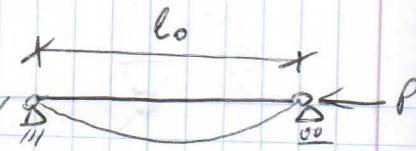


Carico critico di EULERO :=

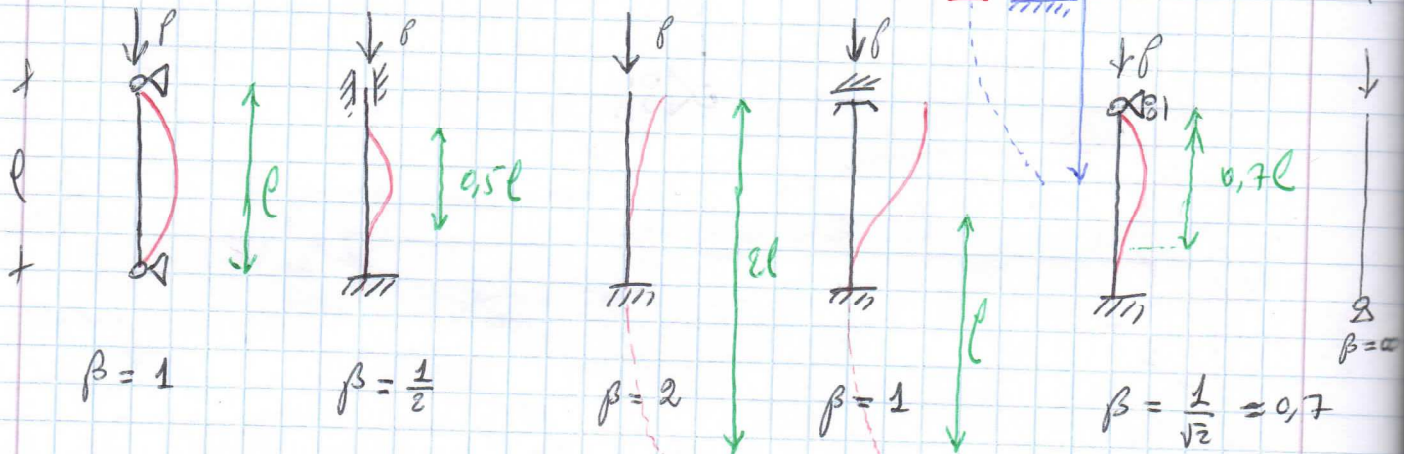


$$P_n = \frac{n^2 \cdot \pi^2 \cdot EI}{l_0^2}, \quad n = 1, 2, 3, \dots$$

1)
$$P_{cr} = \frac{\pi^2 \cdot EI}{l_0^2} \quad : \quad - P_{cr} = \min \{ P_1, P_2, P_3, \dots \}$$

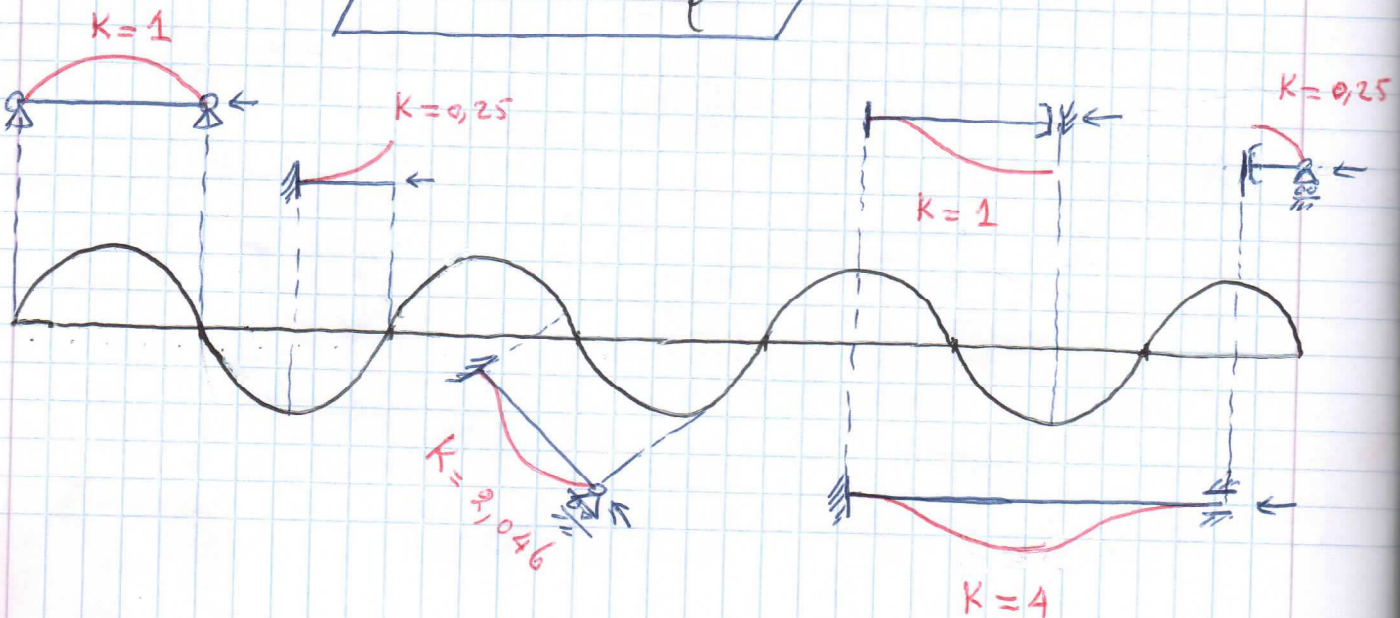
L'espressione 1) dipende dalle c.c.

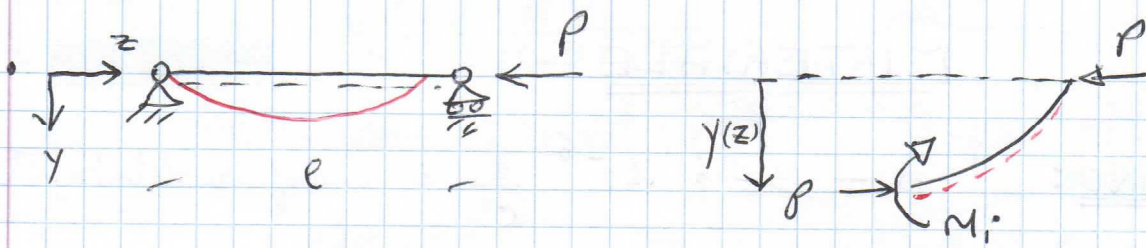
$$P_{cr} = \frac{\pi^2 \cdot EI}{(\beta l)^2}$$



alternativa:

$$P_{cr} = K \cdot \frac{\pi^2 \cdot EI}{l^2}$$





$$M_i = M_e$$

$$-y'' \cdot EI = P \cdot y(z)$$

$$y'' \cdot EI + P y(z) = 0$$

$$y'' + \left(\frac{P}{EI} \right) y = 0$$

Eq. diff. del 2° ordine omogenea
a coef. costanti!

$$\left. \begin{array}{l} \alpha^2 = \frac{P}{EI} \quad \textcircled{I} \\ \alpha = \sqrt{P/EI} \end{array} \right\}$$

Eq. caratteristica associata:

$$\lambda^2 + \alpha^2 = 0 \quad \Rightarrow \quad \lambda^2 = -\alpha^2 \quad \left. \begin{array}{l} \lambda_1 = +i\alpha \\ \lambda_2 = -i\alpha \end{array} \right\}$$

$$y(z) = c_1 \cos(\alpha z) + c_2 \sin(\alpha z)$$

$$c.c. \quad \left\{ \begin{array}{l} y(0) = 0 \quad \rightarrow \quad c_1 = 0 \\ y(l) = 0 \quad \rightarrow \quad c_2 \sin(\alpha l) = 0 \quad \Rightarrow \quad \frac{\alpha l}{l} = \frac{n\pi}{l} \end{array} \right.$$

$$\alpha = \frac{n \cdot \pi}{l} \quad \Rightarrow \quad \alpha^2 = \frac{n^2 \cdot \pi^2}{l^2} \quad \textcircled{II}$$

uguagliando \textcircled{I} e \textcircled{II}

$$P = \frac{n^2 \cdot \pi^2}{l^2} \cdot EI$$

$$P_{cr} = \min \{ P_n \} = \boxed{P_1 = \frac{\pi^2 \cdot EI}{l^2}} !$$