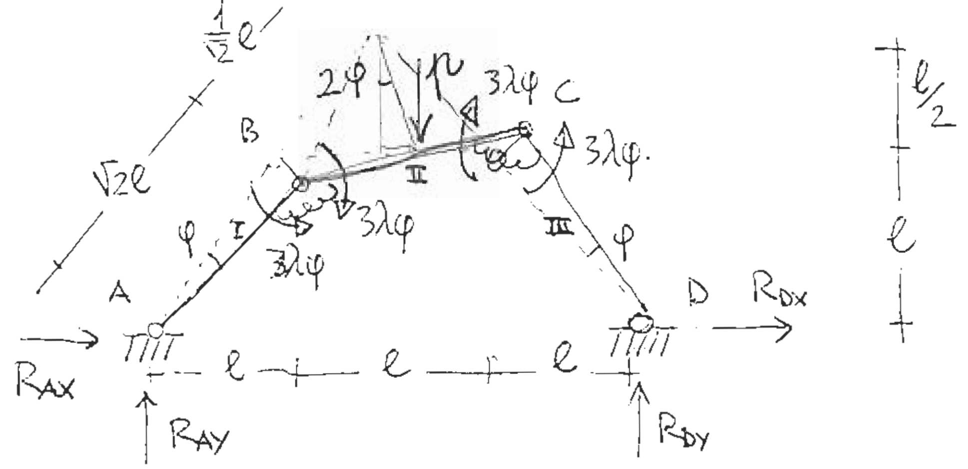


$\boxed{8}$

$\begin{cases} \text{3 equ. equilibrio globale} \\ \text{2 equ. equilibrio del mom. parziale} \end{cases}$

$$F_x = R_{AX} + R_{DX} = 0$$

$$F_y = R_{AY} + R_{DY} - p = 0$$

$$\left.\begin{aligned} M_A &= R_{DY}(3\ell) - p\left[\frac{\ell}{2}(2\varphi) + \frac{3}{2}\ell\right] = 0 \\ M_A^{III} &= 3\lambda\varphi + R_{DY}(\ell - \ell\varphi) + R_{DX}(\ell + \ell\varphi) = 0 \\ M_A^{II\,III} &= -3\lambda\varphi + R_{DY}(2\ell - \ell\varphi) + R_{DX}(\ell - \ell\varphi) - p\frac{\ell}{2} = 0 \end{aligned}\right\} \begin{array}{l} \text{3 equ. in} \\ \text{3 incognite} \\ R_{DX}, R_{DY}, p \text{ (oppure } \varphi) \end{array}$$

$$R_{DY} = p\left(\varphi/3 + \frac{1}{2}\right)$$

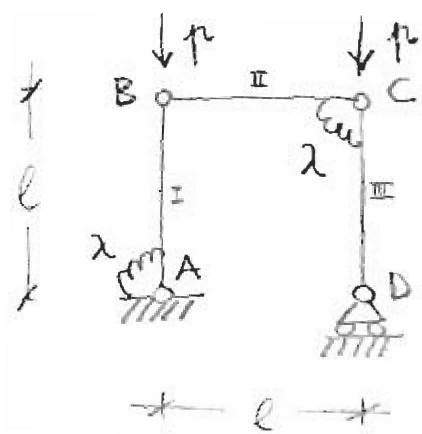
$$R_{DX}\,\ell(1+\varphi) \simeq \frac{R_{DX}\,\ell}{1-\varphi} = -3\lambda\varphi - p\ell\overbrace{\left(\frac{\varphi}{3} + \frac{1}{2}\right)(1-\varphi)}^{-\frac{\varphi^2}{3} + \left(\frac{1}{3} - \frac{1}{2}\right)\varphi + \frac{1}{2}} =$$

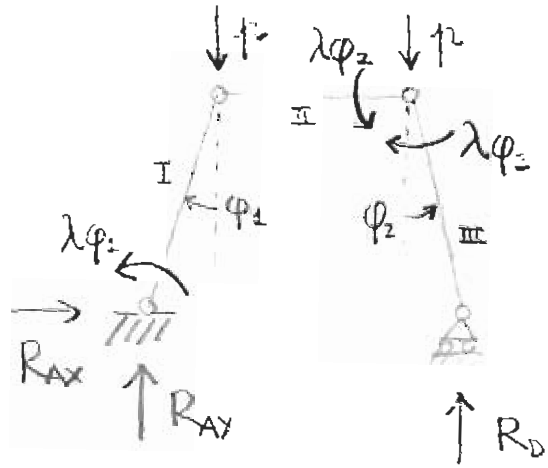
$$= -3\lambda\varphi - p\ell\left(\frac{1}{2} - \varphi/6\right)$$

$$\Rightarrow R_{DX} = -3\frac{\lambda}{\ell}\varphi - p\underbrace{\left(\frac{1}{2} - \frac{\varphi}{6}\right)(1-\varphi)}_{\frac{1}{2} + \frac{\varphi^2}{6} - \left(\frac{1}{6} + \frac{1}{2}\right)\varphi} = -3\frac{\lambda}{\ell}\varphi - p\left(\frac{1}{2} - \frac{2}{3}\varphi\right)$$

$$-3\lambda\varphi + p\ell\underbrace{\left(\frac{\varphi}{3} + \frac{1}{2}\right)(2-\varphi)}_{\left(\frac{2}{3} - \frac{1}{2}\right)\varphi + 1 - \frac{\varphi^2}{3}} + \underbrace{(\varphi - 1)}_{\varphi^2 - \varphi}\left[3\lambda\varphi + p\underbrace{\left(\frac{1}{2} - \frac{2}{3}\varphi\right)}_{\left(\frac{1}{2} + \frac{2}{3}\right)\varphi - \frac{1}{2} - \frac{2}{3}\varphi^2}\right] - p\frac{\ell}{2} = 0$$

$$-6\lambda\varphi + p\ell\left[\cancel{1 - \frac{1}{2} - \frac{1}{2}} + \left(\frac{1}{6} + \frac{7}{6}\right)\varphi\right] = 0 \qquad p_{crit} = \frac{9}{2}\frac{\lambda}{\ell}$$





$R_{AX} = 0$

$$M_C^{III} - \lambda\varphi_2 + R_D\ell\varphi_2 = 0 \iff \varphi_2(R_D\ell - \lambda) = 0 \Rightarrow \begin{cases} \varphi_2 \neq 0, \; R_D = \dfrac{\lambda}{\ell} \\ \text{oppure} \\ \varphi_2 = 0 \end{cases}$$

$$M_B^{I} = \lambda\varphi_1 - R_{AY}\ell\varphi_1 = 0 \Rightarrow \begin{cases} \varphi_1 \neq 0, \; R_{AY} = \dfrac{\lambda}{\ell} \\ \text{oppure} \\ \varphi_1 = 0 \end{cases}$$

$$M_A = \lambda\varphi_1 - p\ell\varphi_1 - p\ell(1+\varphi_1) + R\ell(1+\varphi_1+\varphi_2) = 0$$

caso in cui

$$\varphi_2 \neq 0 \text{ e } \varphi_1 \neq 0 \Rightarrow R_{AY} = R_D = \frac{\lambda}{\ell}$$

$$\lambda(1 + 2\varphi_1 + \varphi_2) - p\ell(1+2\varphi_1) = 0$$

$$\lambda - p\ell + \underbrace{2\varphi_1(\lambda - p\ell) + \varphi_2\lambda}_{\text{termini 'piccoli' (infinitesimi)}} = 0 \Rightarrow p_c = \frac{\lambda}{\ell}$$

$\Rightarrow$ sono trascurabili rispetto ai termini finiti

Quando $p = p_c$ esiste una configurazione di equilibrio in cui almeno uno dei due parametri φ_1, φ_2 è diverso da zero.