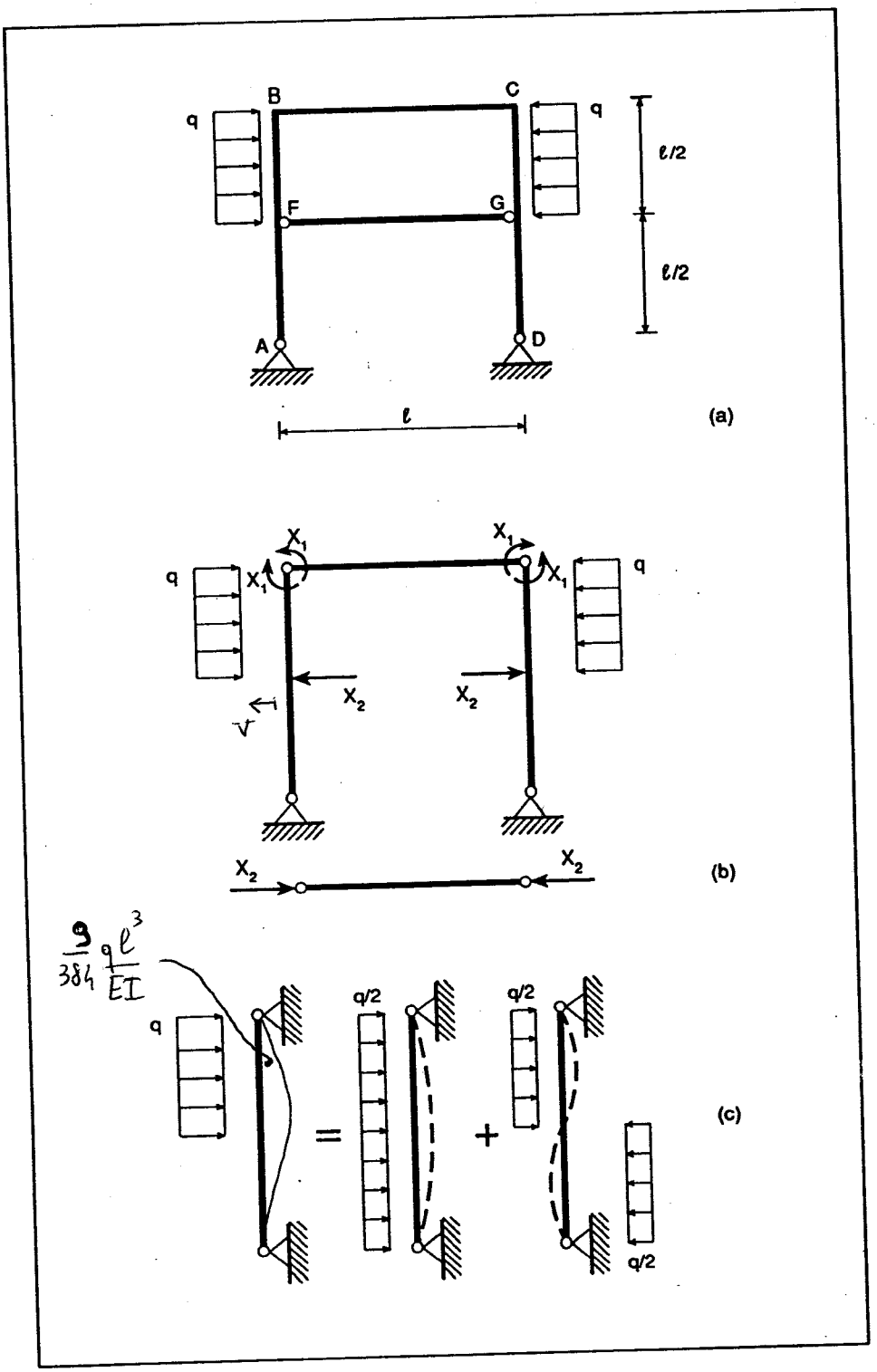


Figura 15.9

EQ. DI CONGRUENZA

$$+\circlearrowright \quad \varphi \begin{cases} \varphi_{BC} = \varphi_{BA} \\ V_F = 0 \end{cases} \qquad \leftarrow + \downarrow$$

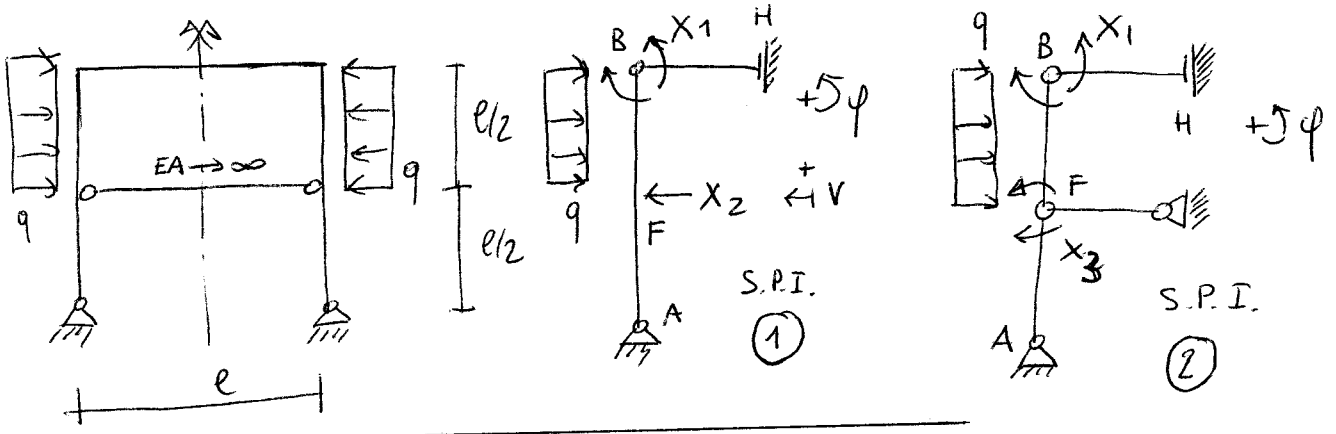
$$\frac{X_1 \ell}{3EI} + \frac{X_1 \ell}{6EI} = -\frac{X_1 \ell}{3EI} - \frac{X_2 \ell^2}{16EI} + \frac{9}{384}\frac{q\ell^3}{EI}$$

$$\frac{X_1 \ell^2}{16EI} + \frac{X_2 \ell^3}{48EI} - \frac{5}{384}\frac{q\ell^4}{2EI} = 0$$

$$X_1 = \frac{3}{496} q\ell^2$$

$$X_2 = \frac{73}{248} q\ell$$

ESERCIZIO FIG. 15.9 (CARPINTERI 2)

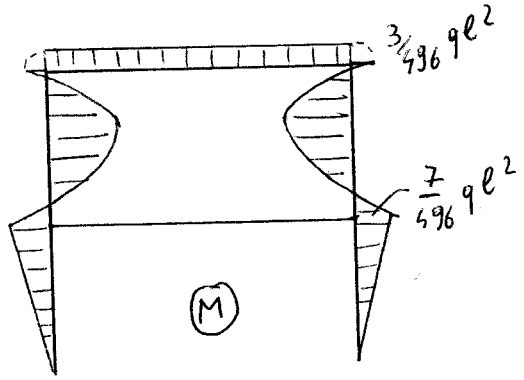


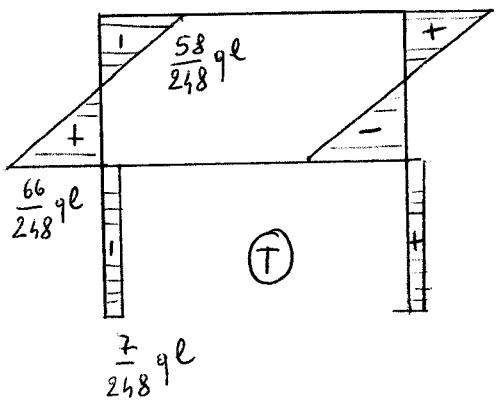
EQ. DI CONGRUENZA SPI (1)

$$\begin{cases} \varphi_{BA} = \varphi_{BH} \\ V_F = 0 \end{cases} \qquad \begin{cases} -\dfrac{X_1 \ell}{3EI} + \dfrac{9}{384}\dfrac{q\ell^3}{EI} - \dfrac{X_2 \ell^2}{16EI} = +\dfrac{X_1 \ell/2}{EI} \\ \dfrac{X_1 \ell^2}{16EI} + \dfrac{X_2 \ell^3}{48EI} - \dfrac{5}{384}\dfrac{q\ell^4}{2EI} = 0 \end{cases} \qquad \begin{cases} X_1 = \dfrac{3}{496} q\ell^2 \\ X_2 = \dfrac{73}{248} q\ell \end{cases}$$

EQ. DI CONGRUENZA SPI (2)

$$\begin{cases} \varphi_{BA} = \varphi_{BF} \\ \varphi_{FB} = \varphi_{FA} \end{cases} \qquad \begin{cases} -\dfrac{X_1 \ell/2}{3EI} - \dfrac{X_3 \ell/2}{6EI} + \dfrac{q(\ell/2)^3}{24EI} = \dfrac{X_1 \ell/2}{EI} \\ \dfrac{X_3 \ell/2}{3EI} + \dfrac{X_1 \ell/2}{6EI} - \dfrac{q(\ell/2)^3}{24EI} = -\dfrac{X_3 \ell/2}{3EI} \end{cases} \qquad \begin{cases} X_1 = \dfrac{3}{496} q\ell^2 \\ X_3 = \dfrac{7}{496} q\ell^2 \end{cases}$$





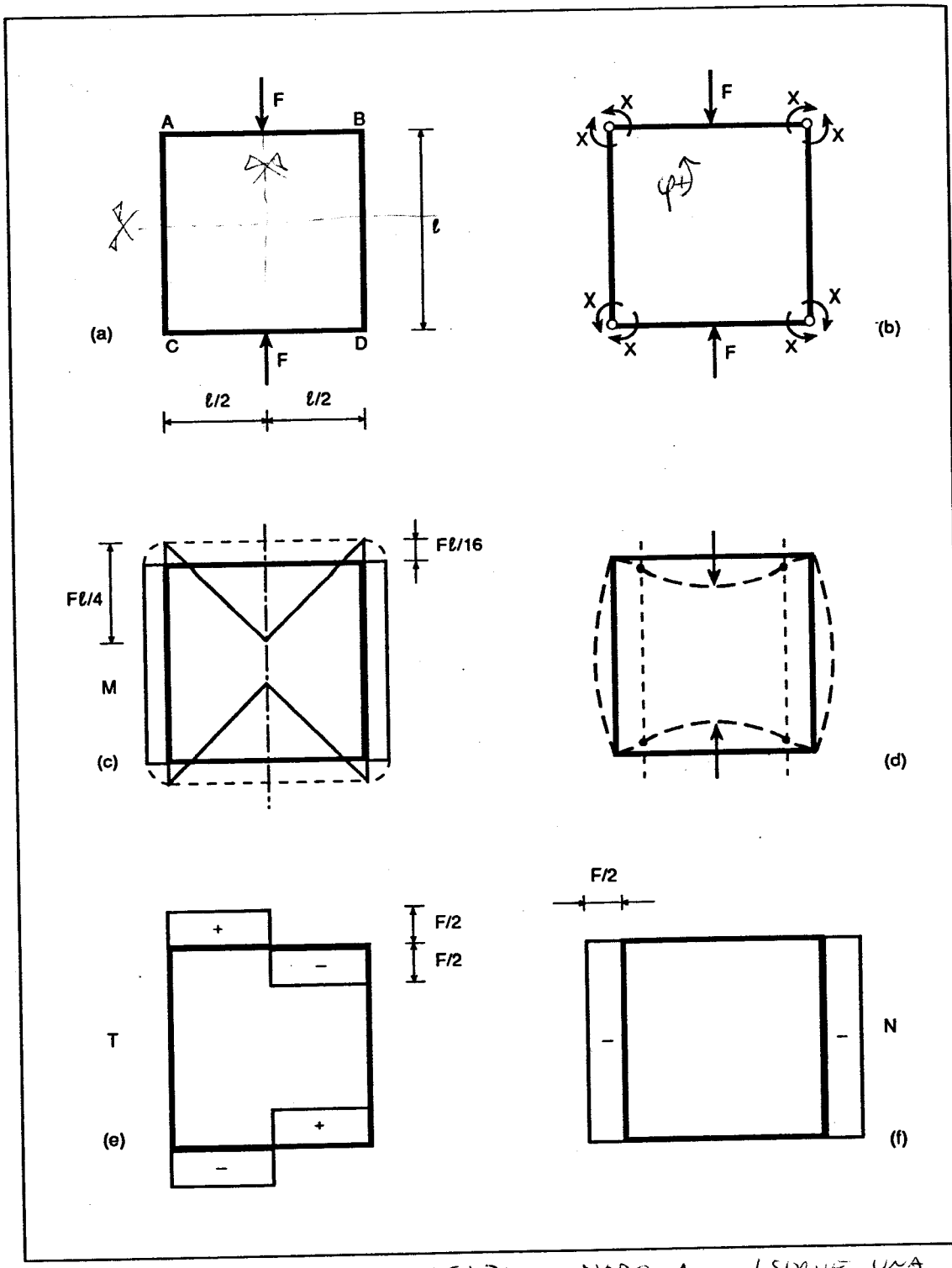
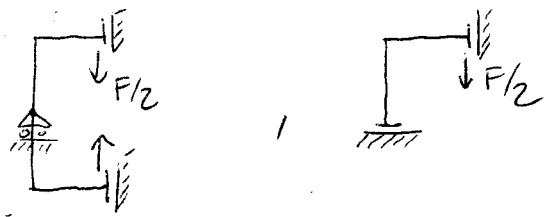


Figura 15.8

EQ. DI CONGRUENZA MODO A (SERVE UNA SOLA EQUAZIONE IN UNA INCOGNITA)

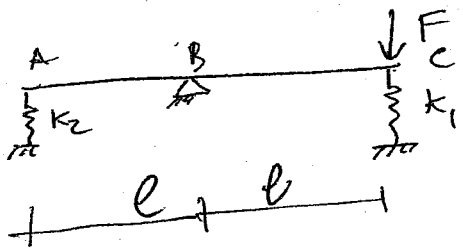
$$\frac{X\ell}{3EI} + \frac{X\ell}{6EI} - \frac{F\ell^2}{16EI} = -\frac{X\ell}{3EI} - \frac{X\ell}{6EI} \quad \rightarrow \quad X = \frac{F\ell}{16}$$

SCHEMI ALTERNATIVI BASATI SULLA SIMMETRIA

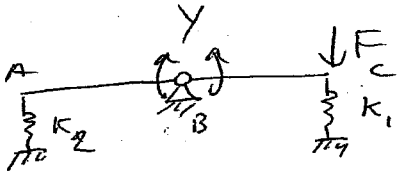


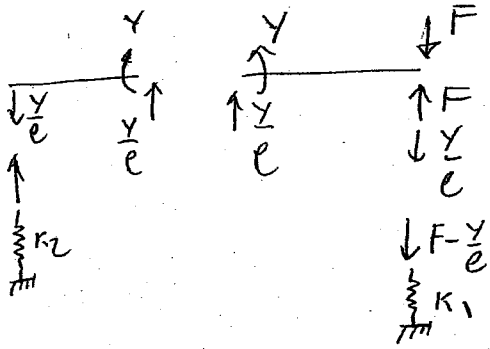
CARRELLO CHE BLOCCA IL MOTO RIGIDO VERTICALE

ESERCIZIO



S.P.

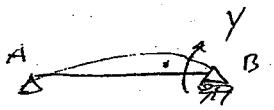




$\curvearrowright + \boxed{\varphi_{BA} = \varphi_{BC}}$ congruenza

$\varphi_{BA}(Y,$ moto rigido molle$)$

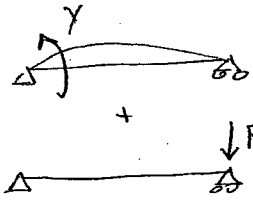
$\varphi_{BC}(Y, F,$ moto rigido molle$)$



$$\varphi_{BA} = \frac{Y\ell}{3EI} + \underbrace{\frac{Y}{\ell}\frac{1}{K_2}}_{\delta_2}\frac{1}{\ell}$$

$\frac{Y}{\ell}\frac{1}{K_2} = \delta_2$  allungamento della molla 2

$$\varphi_{BC} = -\frac{Y\ell}{3EI} + \underbrace{\left(F-\frac{Y}{\ell}\right)\frac{1}{K_1}}_{\delta_1}\frac{1}{\ell}$$



$$\frac{Y\ell}{3EI} + \frac{Y}{\ell^2 K_2} = -\frac{Y\ell}{3EI} - \frac{Y}{\ell^2 K_1} + \frac{F}{K_1 \ell}$$

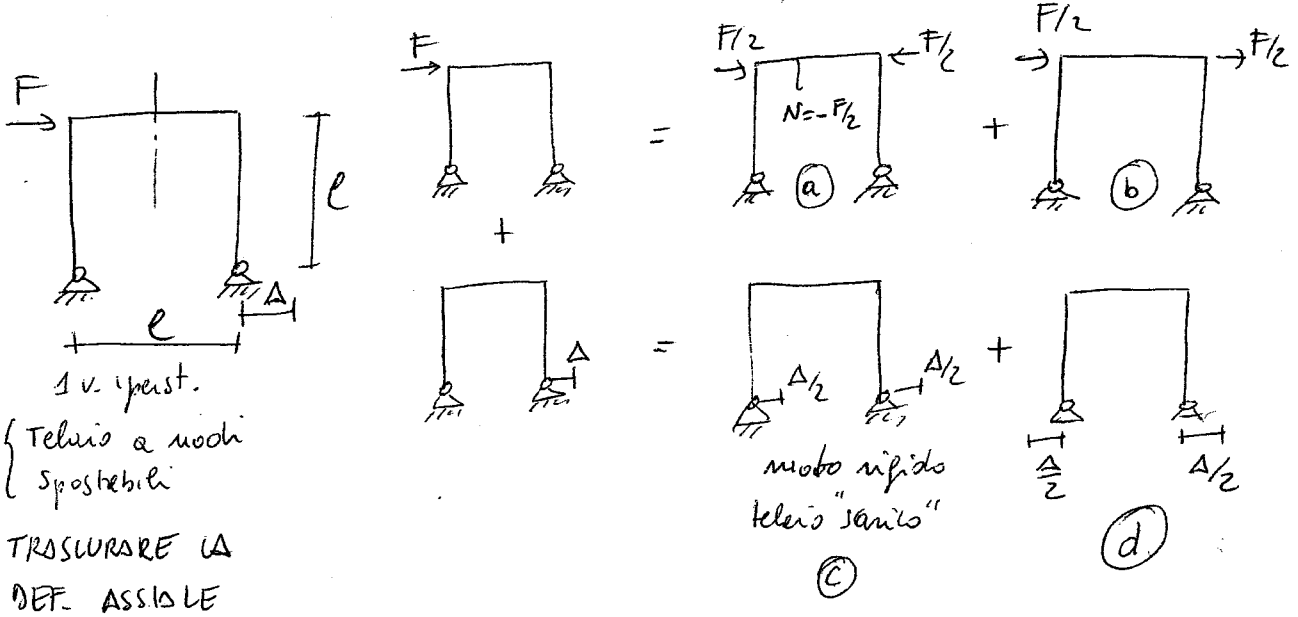
RISOLUZIONE $(K_1 = K_2) \rightarrow \frac{2}{3}\frac{Y\ell}{EI} + \frac{2Y}{\ell^2 K_1} = \frac{F}{K_1 \ell}$

ASSUMO $K_1 = \frac{EI}{\ell^3} \rightarrow \frac{2}{3}Y + 2Y = F\ell \rightarrow \frac{8}{3}Y = F\ell$, $Y = \frac{3}{8}F\ell$

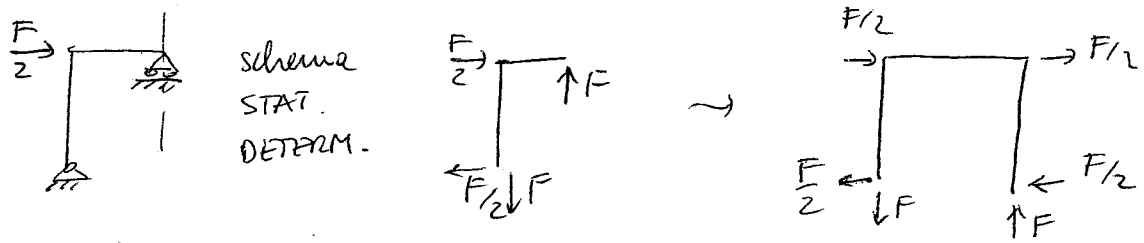
(M) 

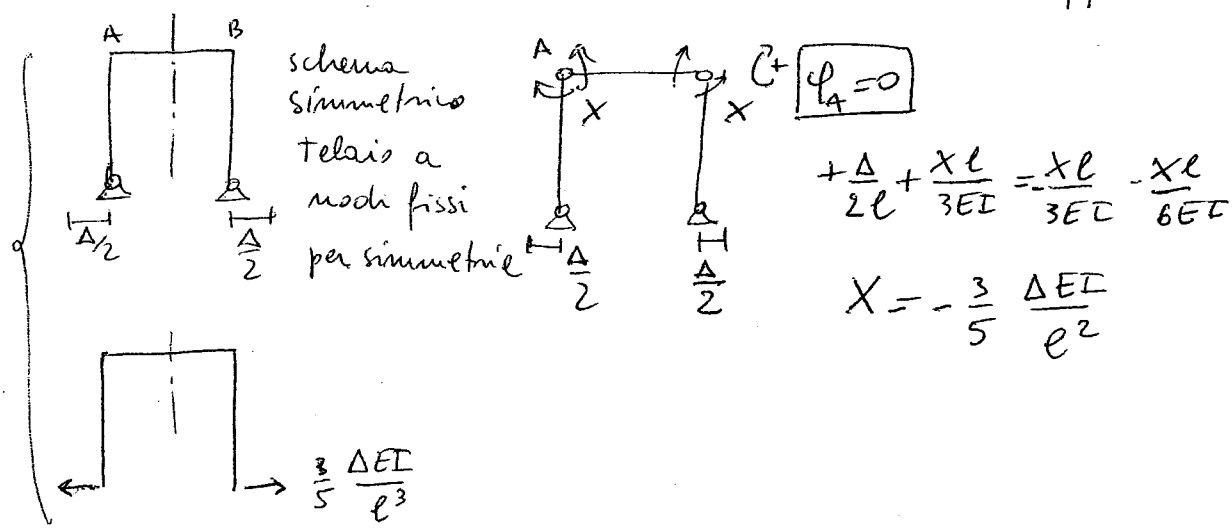
DEFORMATA : δ_1, δ_2 SPOST. MOLLE.

ESERCIZIO (TELAIO A NODI SPOSTABILI)



Occorre risolvere (b) e (d):

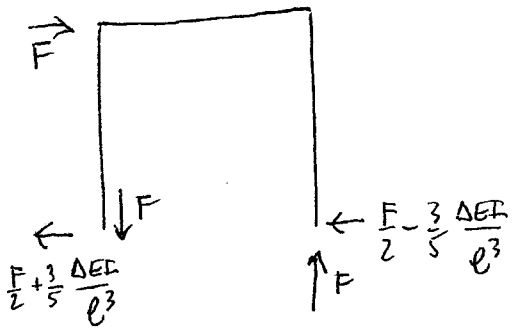
(b): 

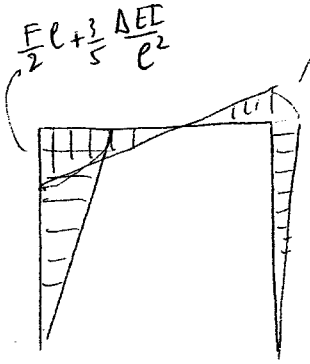
(d): 

$$+\frac{\Delta}{2\ell} + \frac{X\ell}{3EI} = -\frac{X\ell}{3EI} - \frac{X\ell}{6EI}$$

$$X = -\frac{3}{5}\frac{\Delta EI}{\ell^2}$$

Reaz. esterne complessive



(M) 

DEF.