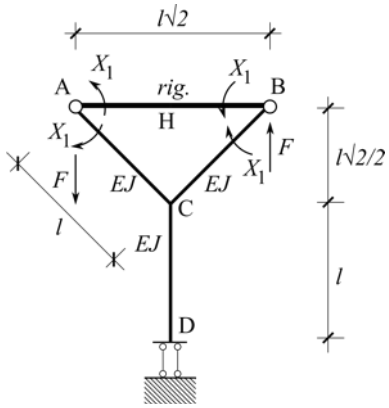
Corso di Laurea in Ingegneria Civile Ambientale Edile – Università di Pisa, a.a. 2020-21
SCIENZA DELLE COSTRUZIONI

(Docenti: Prof. Ing. *Riccardo Barsotti*; Prof. Ing. *Stefano Bennati*)

Prova Scritta del 7 giugno 2022 – Sintesi della soluzione

Problema 1 [16/30].



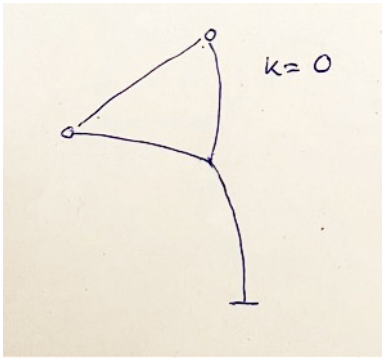
AB) $N_0 = T_0 = 0;\ \ M_0 = 0$ $\qquad N_1 = 0;\ \ T_1 = \sqrt{2}/l;\ \ M_1 = -1 + s\sqrt{2}/l$

AC) $N_0 = -F\sqrt{2}/2;\ \ T_0 = -F\sqrt{2}/2;\ \ M_0 = -Fs\sqrt{2}/2$ $\qquad N_1 = -1/l;\ \ T_1 = -1/l;\ \ M_1 = 1 - s/l$

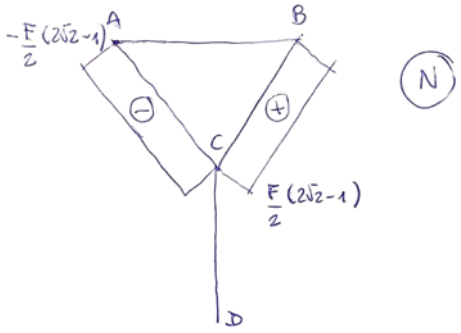
CD) $N_0 = T_0 = 0;\ \ M_0 = Fl\sqrt{2}$ $\qquad N_1 = T_1 = 0;\ \ M_1 = 0$

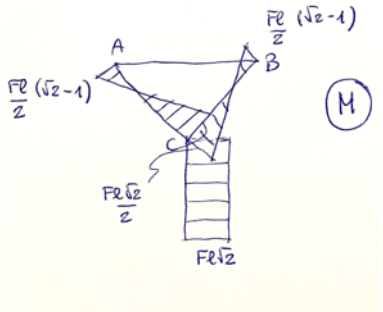
$$\eta_{10} = -\frac{Fl^2\sqrt{2}}{12EJ},\quad \eta_{11} = \frac{l(2+\sqrt{2})}{6EJ},\quad \eta_1 = -\frac{X_1}{k}$$

$$X_1 = Fl\left(\frac{\frac{l\sqrt{2}}{12EJ}}{\frac{l(2+\sqrt{2})}{6EJ} + \frac{1}{k}}\right)$$

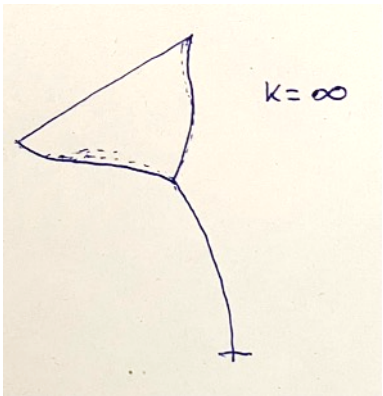


Se k = ∞, $\qquad X_1 = Fl(\sqrt{2} - 1)/2.$



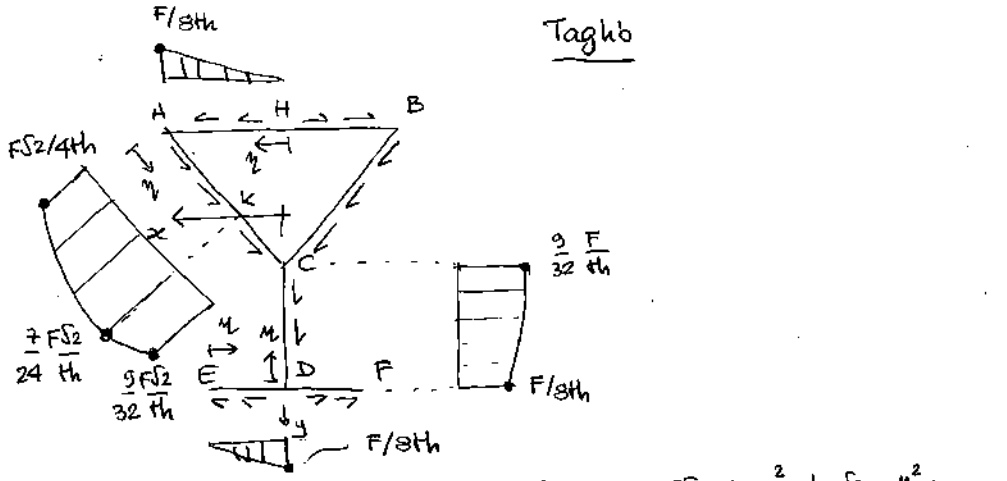


cds



deformate

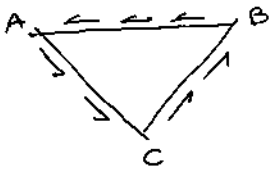
Problema 2 [16/30].



AH) $\tau_{zy} = \frac{F}{8th^2}\eta$ AC) $\tau_{zy} = \frac{3F\sqrt{2}}{16th^3}\left(\frac{4}{3}h^2 + \frac{hy\sqrt{2}}{3} - \frac{\eta^2}{4}\right)$

ED) $\tau_{zy} = -\frac{F}{4th^2}\eta$ DC) $\tau_{zy} = -\frac{3F}{16th^3}\left(\frac{2}{3}h^2 + \frac{4}{3}h\eta - \frac{\eta^2}{2}\right)$

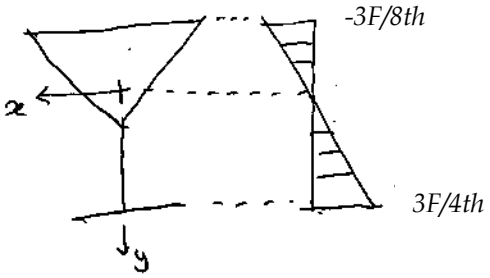
Torsione



$M_T = Fh$

AB) $\tau = \frac{F}{4th}$ AC) BC) $\tau = \frac{F\sqrt{2}}{2th}$

Flessione



3) Uno sforzo di taglio d'intensità $F = 13\sigma_0 ht/10$ non è compatibile con il comportamento elastico.