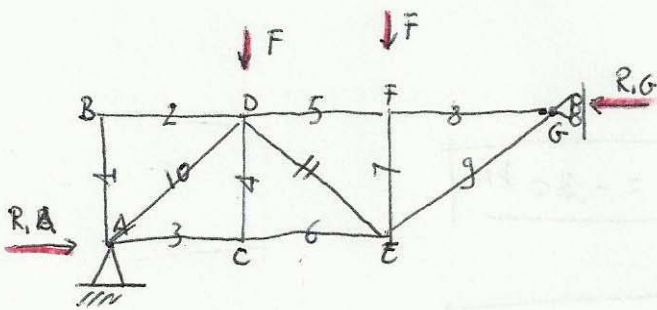


TRAVE RETICOLARE
metodo dei nodi



- $F = 10 \text{ kN}$ $R_1G = 30 \text{ kN}$
- $\uparrow \curvearrowright \oplus$

1) VERIFICA ISOSTATICITA'

$$V_E + \alpha = 2 \cdot \text{num. nodi}$$

dove:

$V_E =$ vincoli esterni (in questo caso nel piano)

$\alpha =$ numero aste

$$\Rightarrow 3 + 11 = 2 \cdot 7 \quad \text{OK}$$

Verificare che $L = V$ dove $L = \text{num. aste} \times \text{gdL nel piano}$

$$L = 3 \cdot 11$$

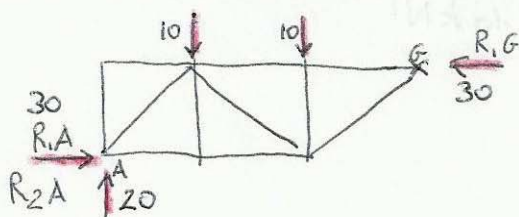
$$V = 30 + 3$$

$$V_E = 3$$

$$V_i = 30 *$$

* per ogni nodo calcolo quanti gdL vengono eliminati tramite: $2(n-1)$ $n = \text{num. corpi intercettati dal nodo}$

2) CALCOLO REAZIONI VINCOLARI



eq. orizzontale

eq. VERTICALE

$$-R_1G + R_1A = 0$$

$$R_1A = R_1G$$

$$R_2A = +20 \text{ kN}$$

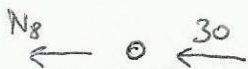
eq. MOMENTO (polo in A)

$$-10 \text{ kN}(1) - 10 \text{ kN}(2) + R_1G(1) = 0 \Rightarrow R_1G = 30 \text{ kN}$$

3) CALCOLO DELLE AZIONI DI CONTATTO (metodo dei nodi)

Nodo \textcircled{G} (o punto G)

eq. ORIZZONTALE

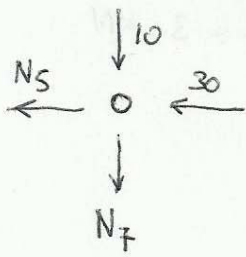


$$-30 - N_8 - \frac{N_9 \sqrt{2}}{2} = 0 \Rightarrow N_8 = -30 \text{ kN}$$

eq. VERTICALE

$$-\frac{N_9 \sqrt{2}}{2} = 0$$

Nodo (F)



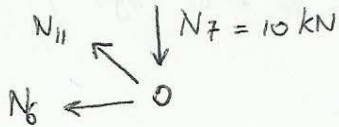
eq. ORIZZONTALE

$$-30 - N_5 = 0 \Rightarrow \boxed{N_5 = -30 \text{ kN}}$$

eq. VERTICALE

$$-10 - N_7 = 0 \Rightarrow \boxed{N_7 = -10 \text{ kN}}$$

Nodo (E)



eq. ORIZZONTALE

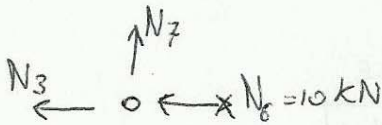
$$-N_6 - N_{11} \frac{\sqrt{2}}{2} = 0 \Rightarrow -N_6 - 10\sqrt{2} \left(\frac{\sqrt{2}}{2}\right) = 0 \Rightarrow \boxed{N_6 = -10 \text{ kN}}$$

eq. VERTICALE

$$-10 \text{ kN} + N_{11} \frac{\sqrt{2}}{2} = 0 ; N_{11} = 10 \left(\frac{2}{\sqrt{2}}\right) ; N_{11} = 10 \cdot \left(\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}\right) ;$$

$$\boxed{N_{11} = 10\sqrt{2} \text{ kN}}$$

Nodo (C)



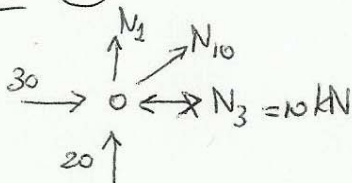
eq. ORIZZONTALE

$$-N_3 - N_6 = 0 \Rightarrow \boxed{N_3 = -10 \text{ kN}}$$

eq. VERTICALE

$$\boxed{N_7 = 0}$$

Nodo (A)



eq. ORIZZONTALE

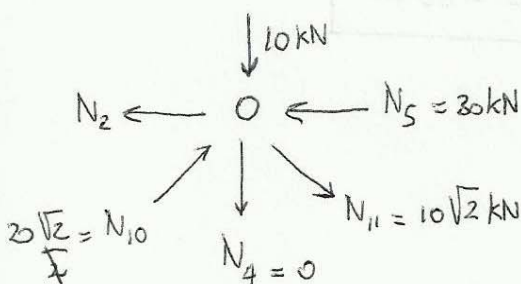
$$+30 - 10 + N_{10} \frac{\sqrt{2}}{2} = 0 ; N_{10} \frac{\sqrt{2}}{2} = -20 \text{ kN}$$

$$\boxed{N_{10} = -20\sqrt{2}}$$

$$\text{eq. VERTICALE } N_1 + 20 \text{ kN} + N_{10} \frac{\sqrt{2}}{2} = 0 ; N_1 = -20 + (-20\sqrt{2}) \frac{\sqrt{2}}{2}$$

$$N_1 = -20 + 20 = 0 \text{ (este e' scartice)} \quad \boxed{N_1 = 0}$$

Nodo (D)



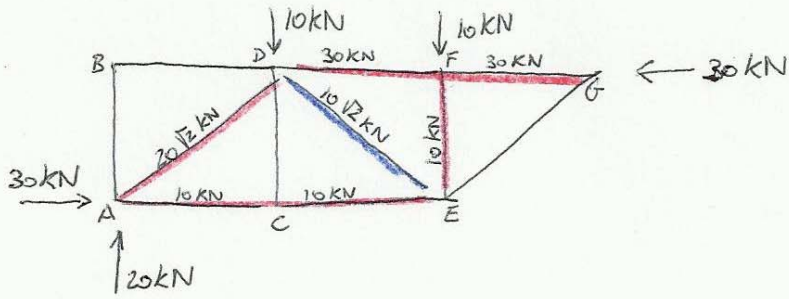
eq. VERTICALE

$$-10 - N_4 + 20\sqrt{2} \left(\frac{\sqrt{2}}{2}\right) - 10\sqrt{2} \left(\frac{\sqrt{2}}{2}\right) = 0 \Rightarrow \boxed{N_4 = 0}$$

eq. ORIZZONTALE

$$-N_2 - 30 + 20\sqrt{2} \left(\frac{\sqrt{2}}{2}\right) + 10\sqrt{2} \left(\frac{\sqrt{2}}{2}\right) = 0 \Rightarrow \boxed{N_2 = 0}$$

Schema sinottico



— asta compressa
— asta tesa
— asta scarica

