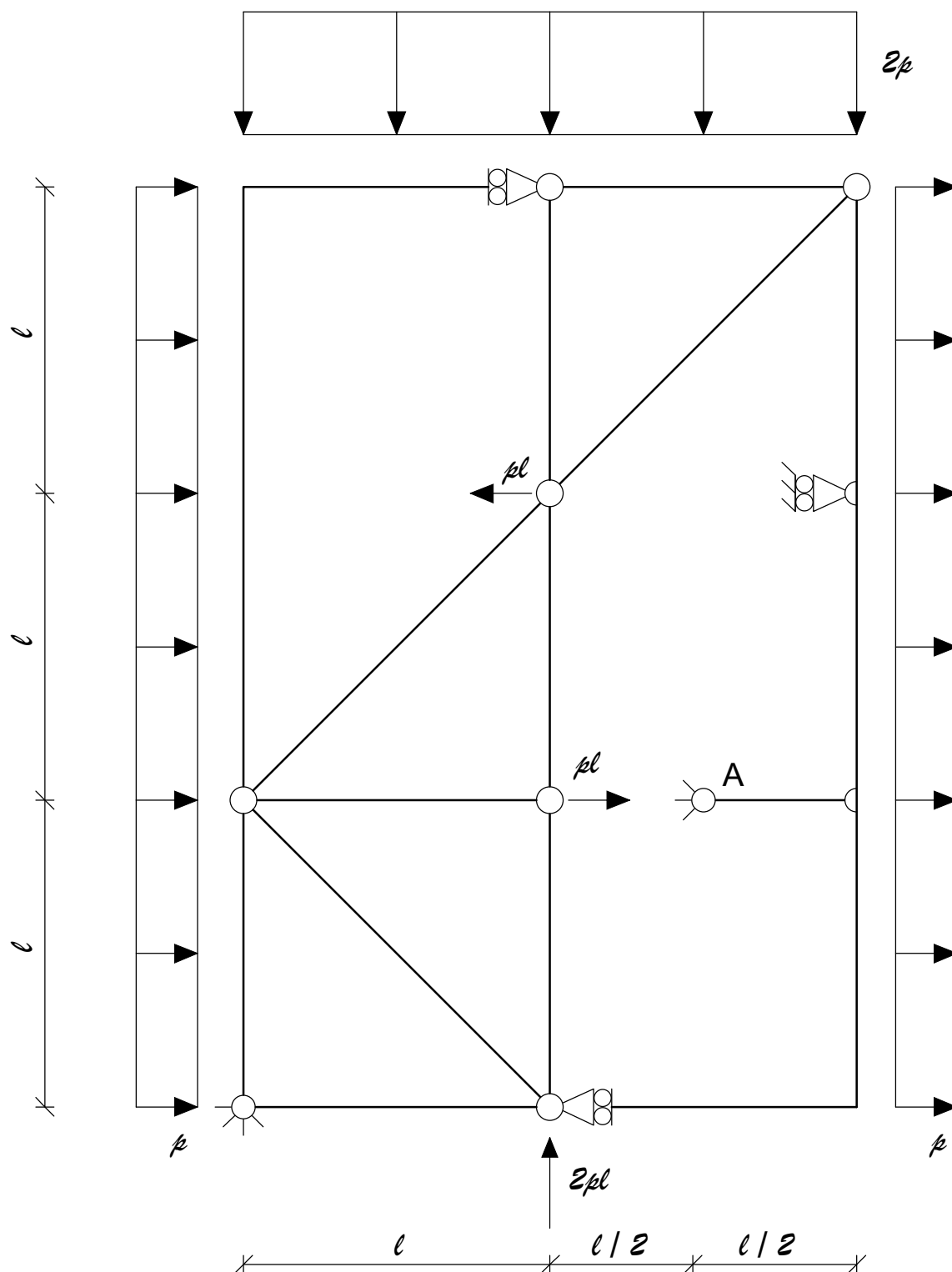


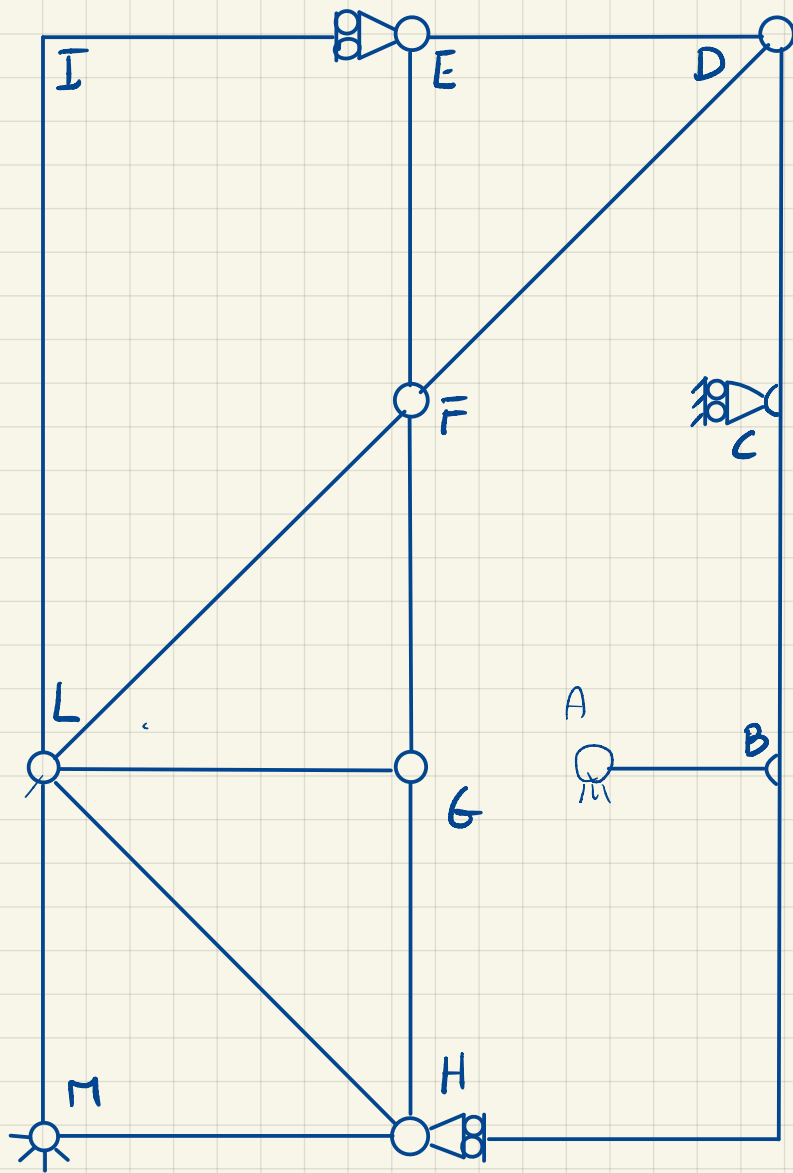
Prova Scritta di SCIENZA DELLE COSTRUZIONI - 5.07.2021 - FILA A

Con riferimento alla struttura in figura:

1. svolgere l'analisi cinematica e classificare la struttura
2. se la struttura risulta staticamente determinata, procedere al punto seguente. Altrimenti, modificare il vincolo in A in modo tale da rendere la struttura staticamente determinata
3. calcolare le reazioni vincolari, e riportare i valori su questo foglio
4. tracciare i diagrammi delle azioni interne, indicando anche i valori di massimo e di minimo e la loro posizione



ANALISI CINEMATICA



• Asta LI: App. istatica non labile (asse del carrello E non passa per L)

• MHLGF \rightarrow struttura formata da triang. inst. non labili (comune proprio non allineate)

• FED \rightarrow triang. inst. non labile.

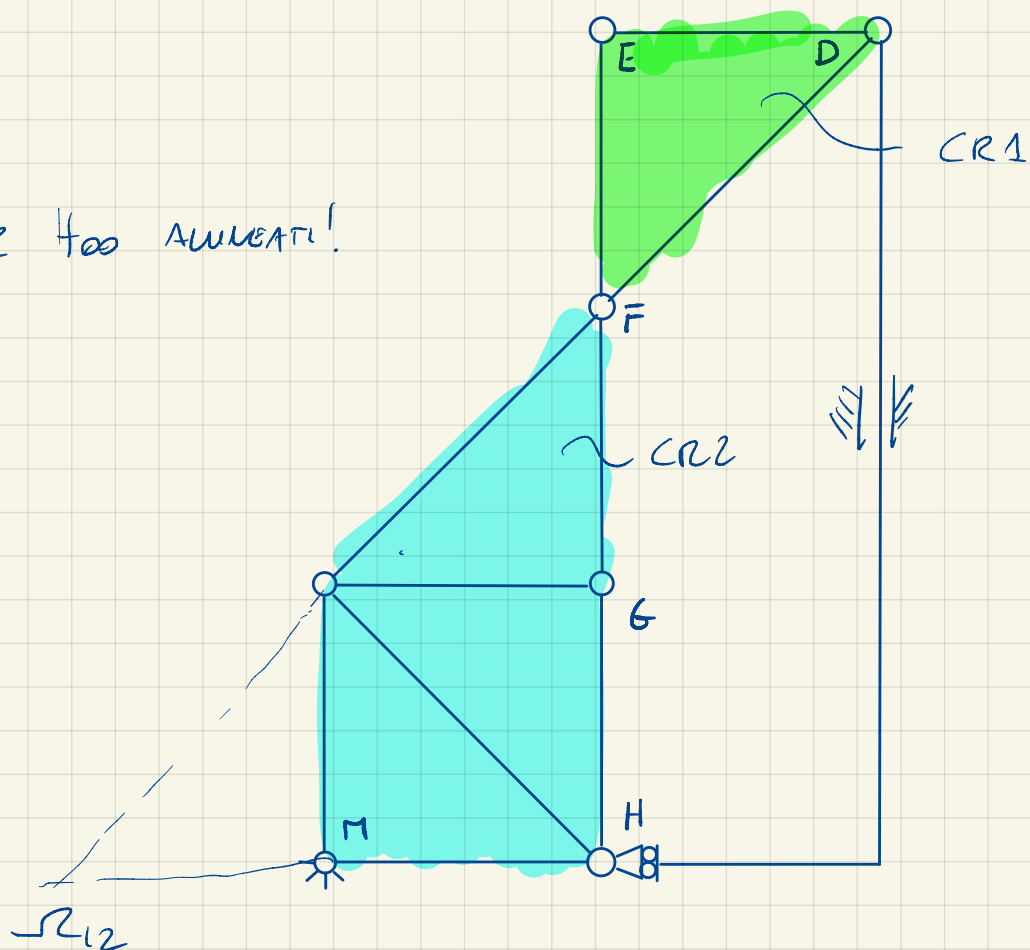
• Bulla AB e carrello in C equiv. a un manico sulla asta BC

\rightarrow combino bulla FDE con carrello in H (CIR Ω_H)

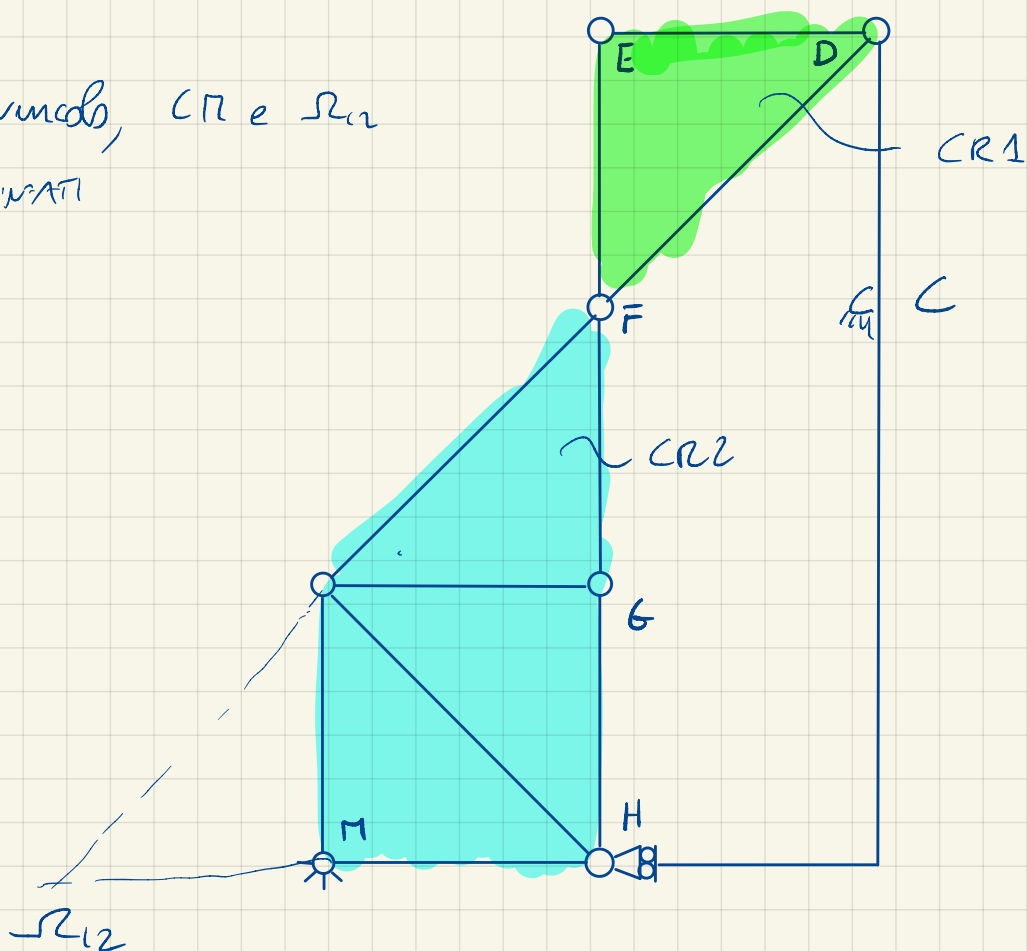
\rightarrow ARRO A 3 C. ALLUNGATE \rightarrow LABILE

\rightarrow CARRO CERCHIA IN A CON UN MANICOTTO

M, R_{12} e H_{00} AUMENTA!



Cambiando vincoli, CR e R_{12}
NON AUMENTA

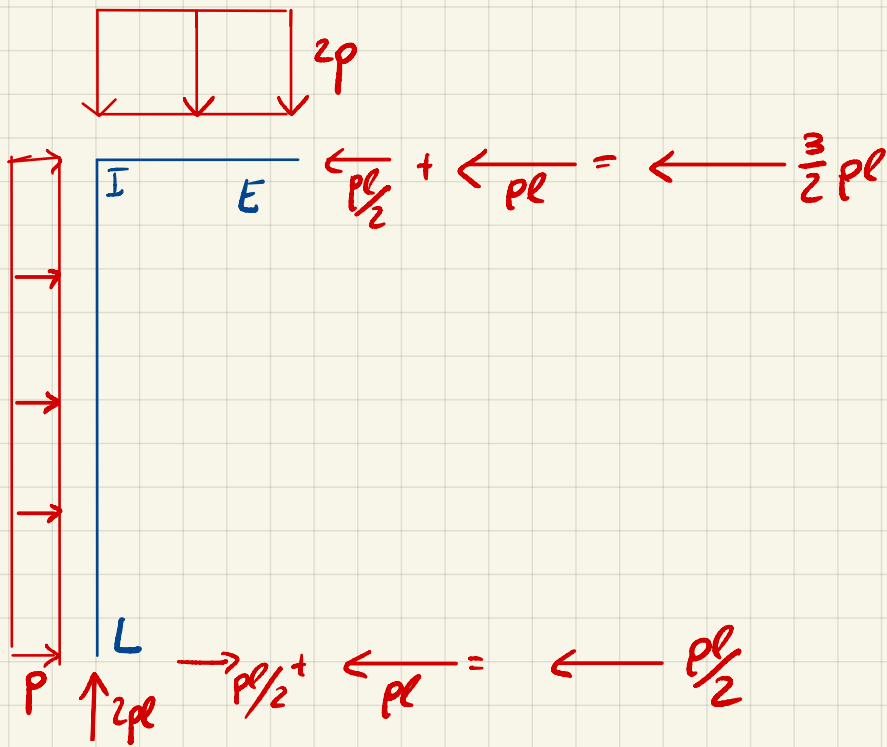




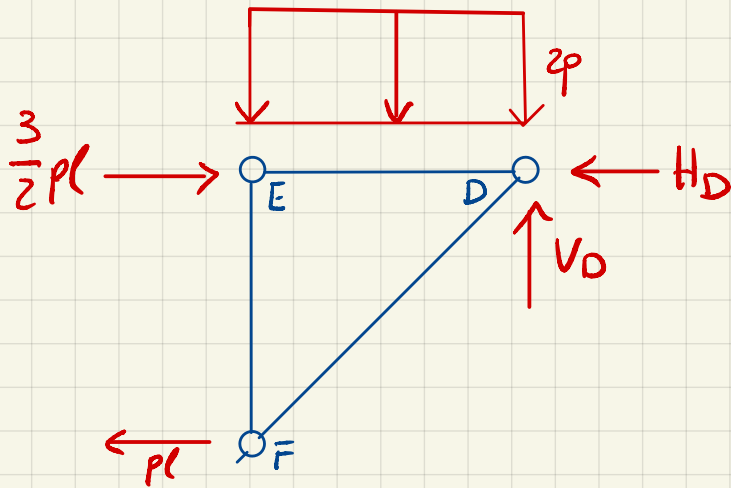
$$\left. \begin{array}{l} \sum M_{(H)} = 0 \\ \sum M_{(HBCD)} = 0 \end{array} \right\} \rightarrow \hookrightarrow 2pl^2 + pl^2 - 4pl^2 - 6pl \cdot \frac{3}{2}l + V_A \cdot \frac{l}{2} + V_A \cdot \frac{3}{2}l - H_C 2l = 0$$

$$H_c = V_A - S_{pl}$$

App. isostatica LIE



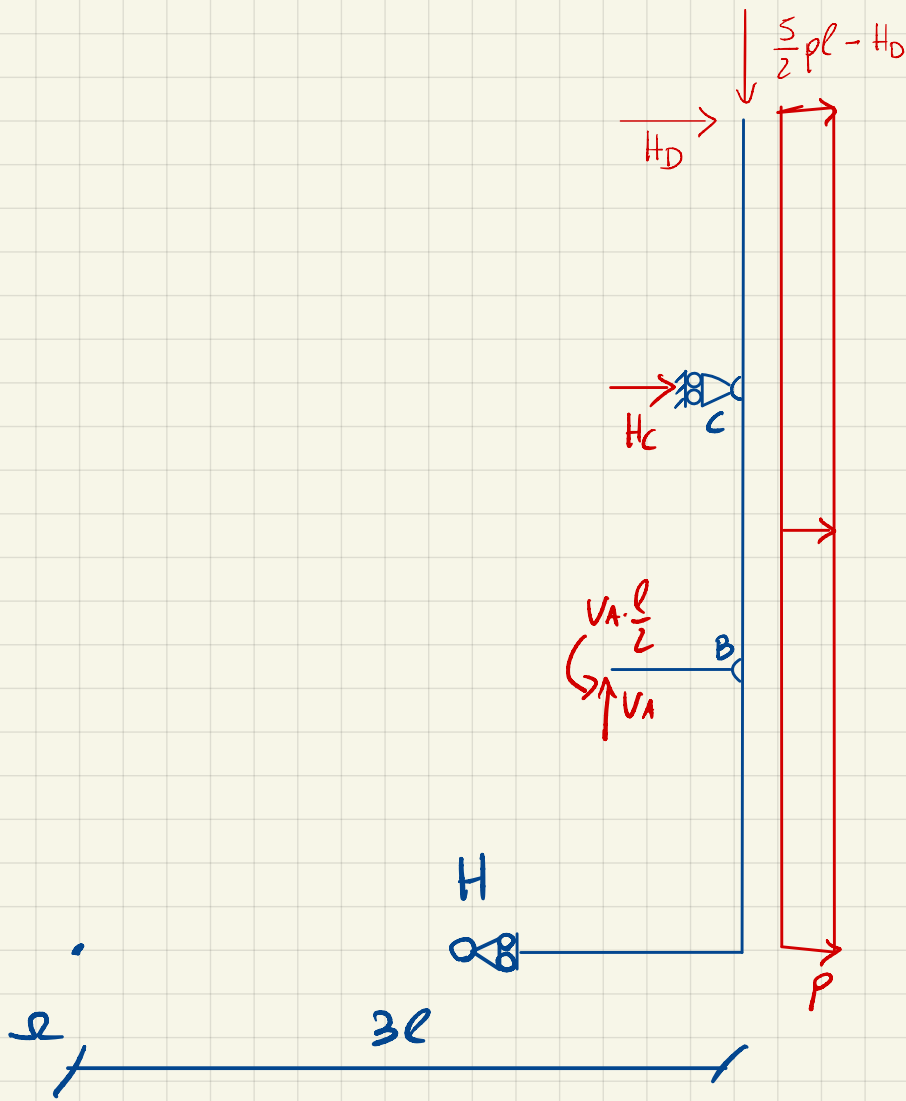
Buella EDF



$$\sum_{EDF} M_{(F)} = 0$$

$$V_D l + H_D l - \frac{3}{2} pl^2 - pl^2 = 0$$

$$V_D = \frac{5}{2} pl - H_D$$



$$\sum M_{DCBH} = 0 \quad \frac{5}{2}pl \cdot 3l - \cancel{H_D \cdot 3l} + \cancel{H_D \cdot 3l} + H_C \cdot 2l + 3pl \cdot \frac{3}{2}l - V_A \cdot \frac{5}{2}l - V_A \cdot \frac{l}{2} = 0$$

$$12pl + 2H_C - 3V_A = 0$$

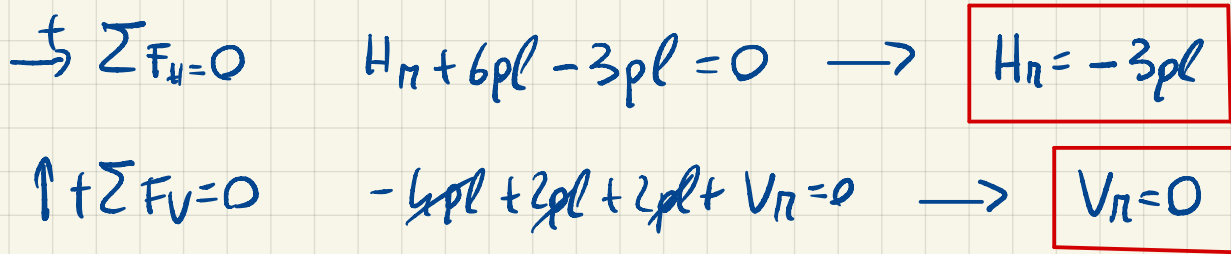
$$\sum M_{(H)} = 0$$

$$H_C = V_A - 5pl$$

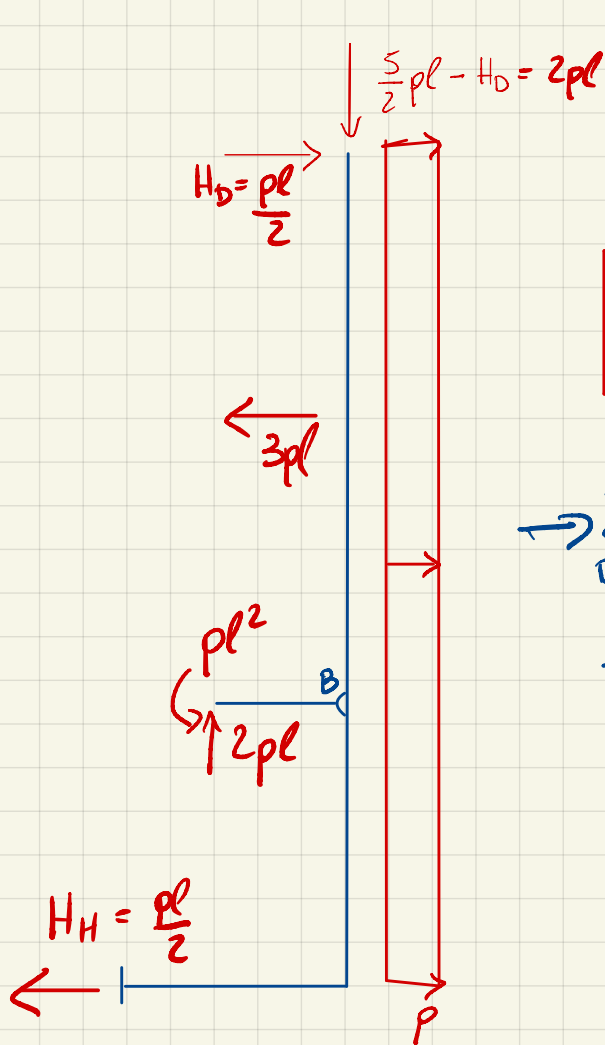
$$12pl + 2V_A - 10pl - 3V_A = 0 \rightarrow$$

$$V_A = 2pl$$

$$H_C = -3pl$$



AZIONI INTERNE



$$\sum_{DBH} F_V = 0$$

$$2pl - \frac{5}{2}pl + H_D = 0$$

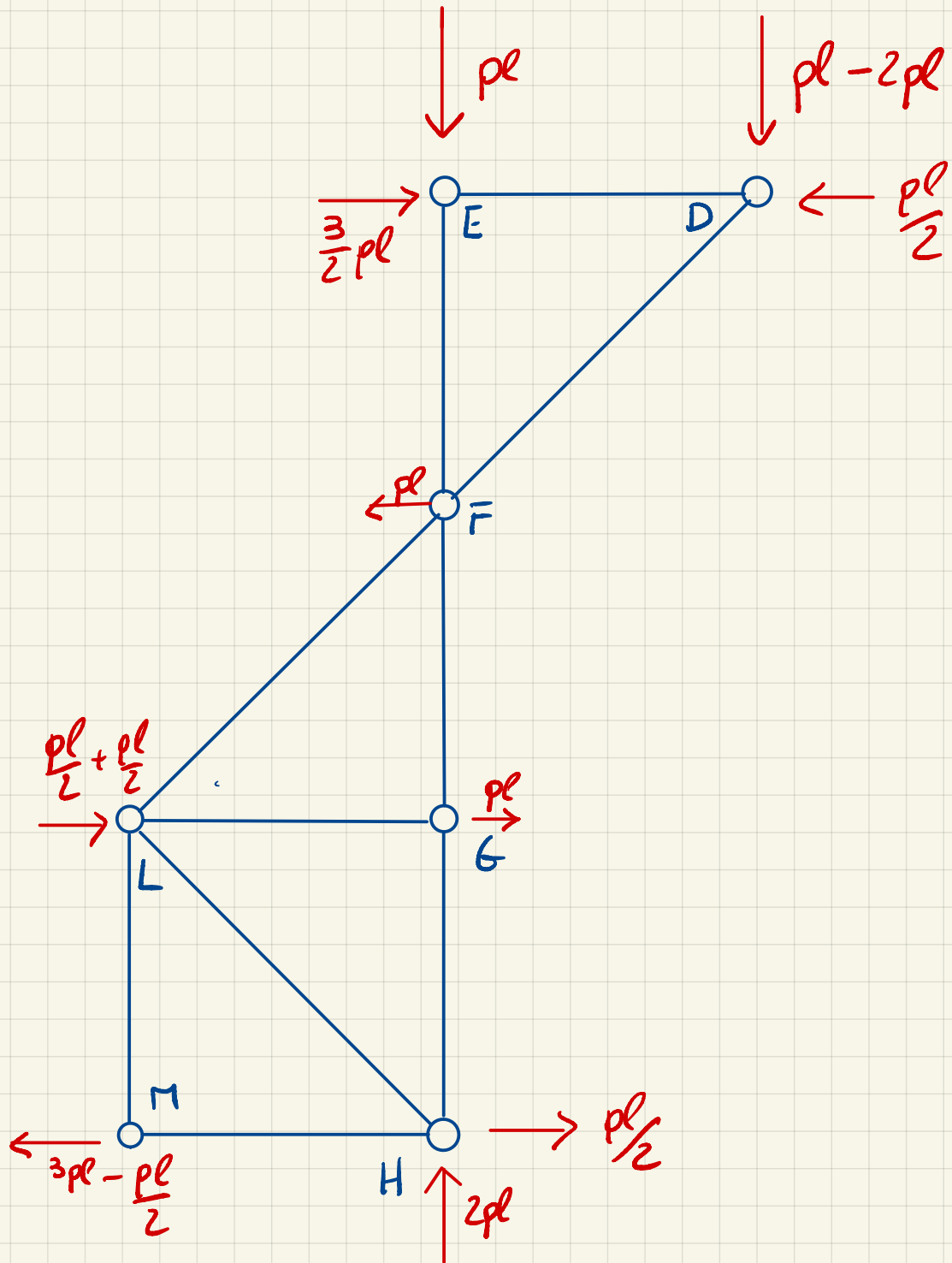
$$H_D = \frac{pl}{2}$$

$$\rightarrow \sum_{DBH} F_H = 0$$

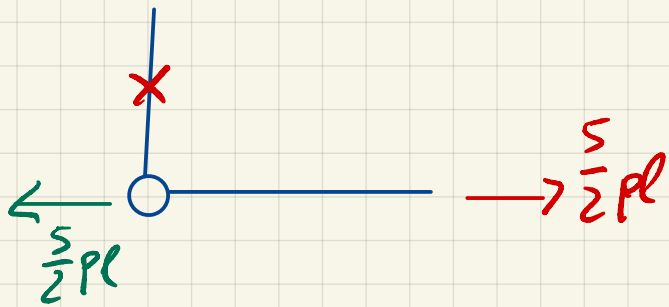
$$-H_H + \frac{pl}{2} - 3pl + 3pl = 0$$

$$H_H = \frac{pl}{2}$$

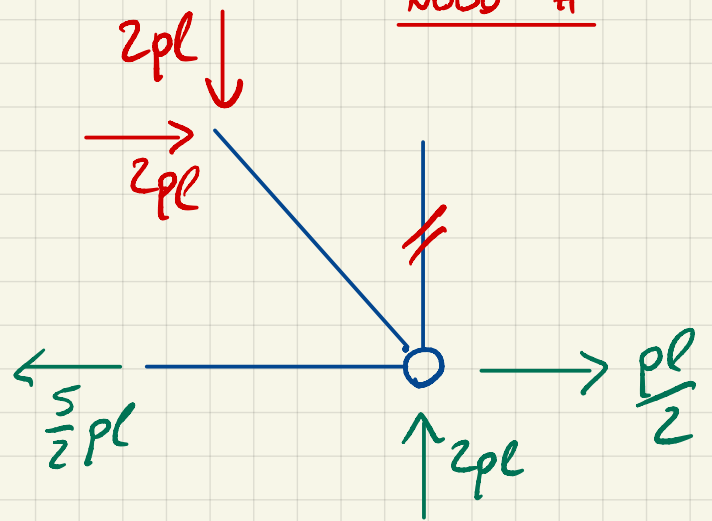
RETICOLARE



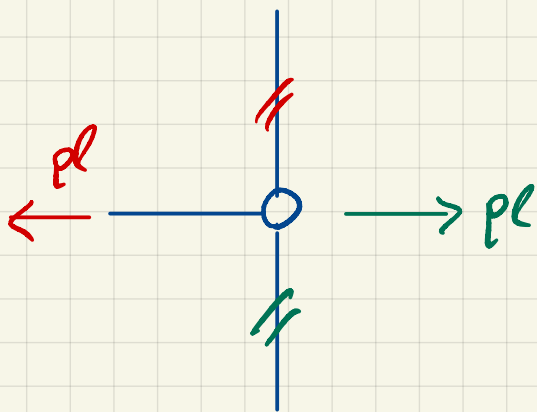
Nodo M



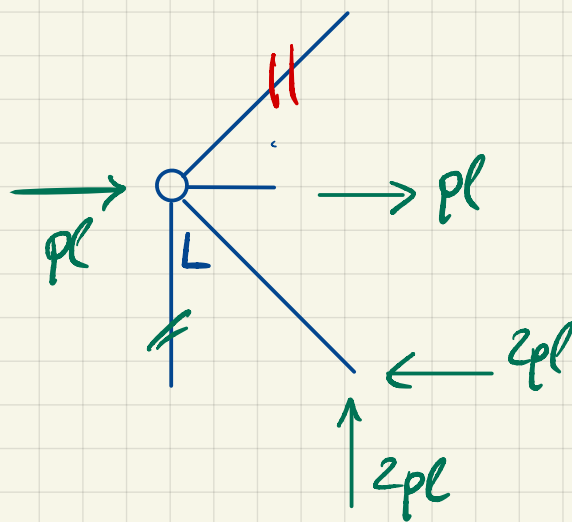
Nodo H



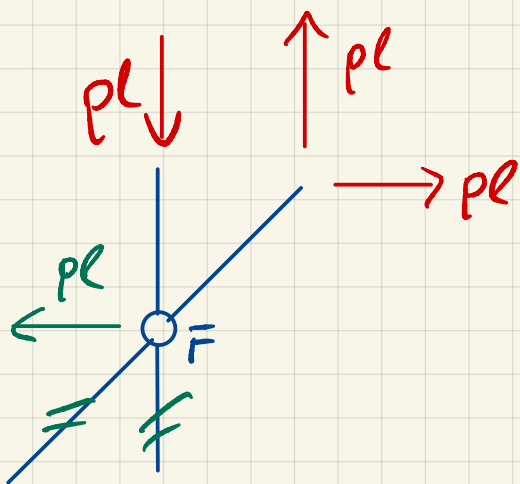
Nodo G



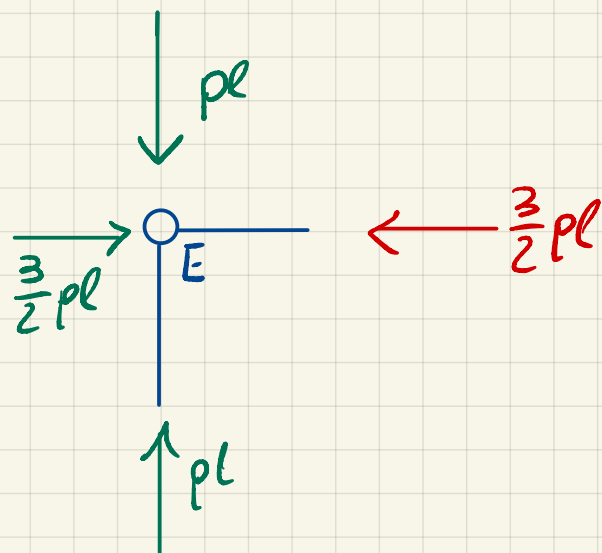
Nodo L



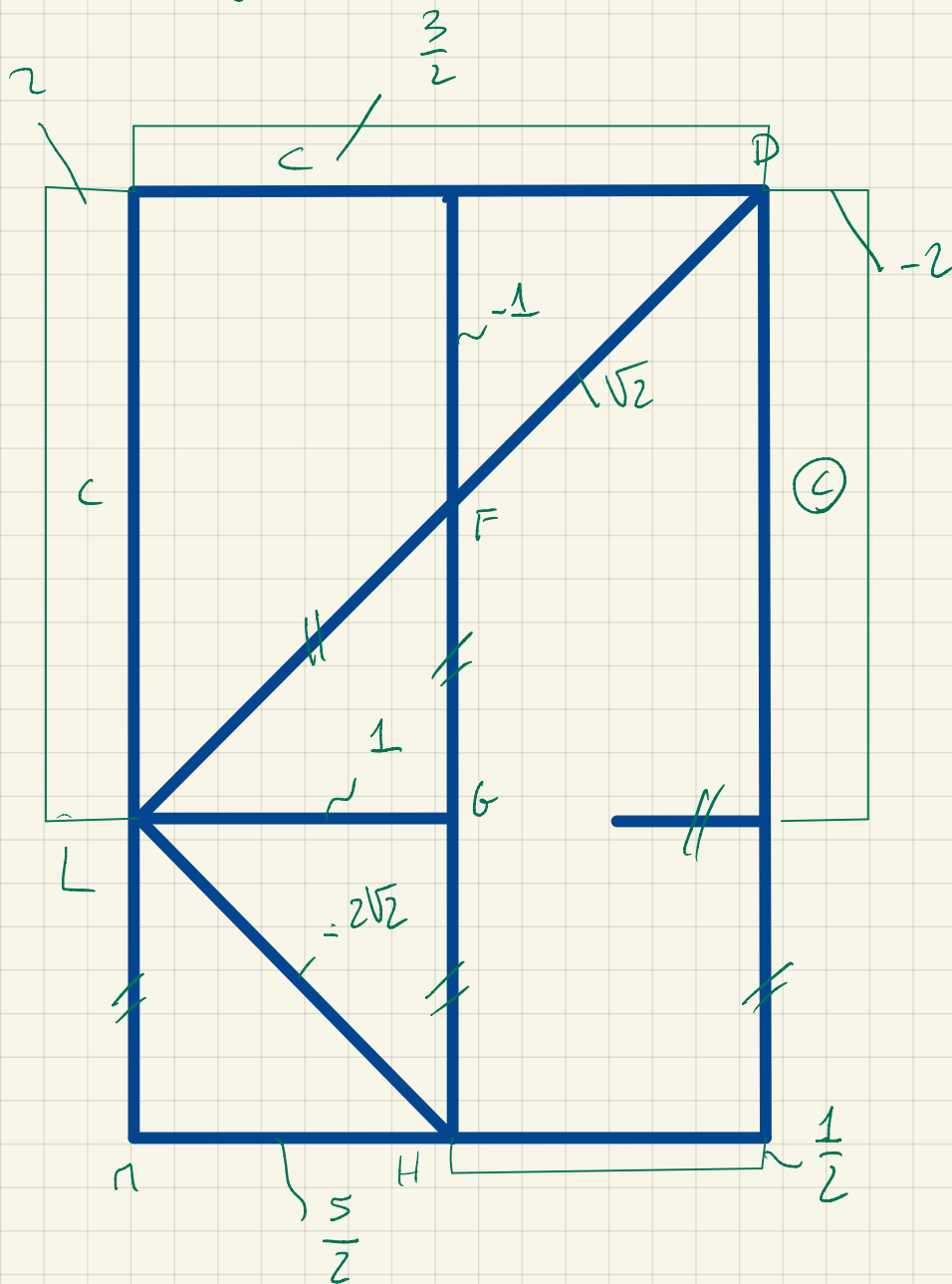
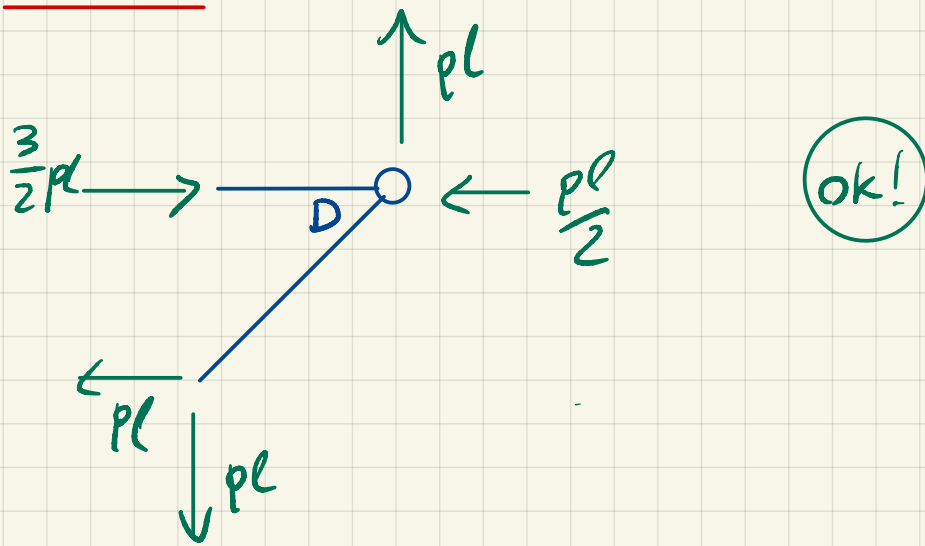
Nodo F



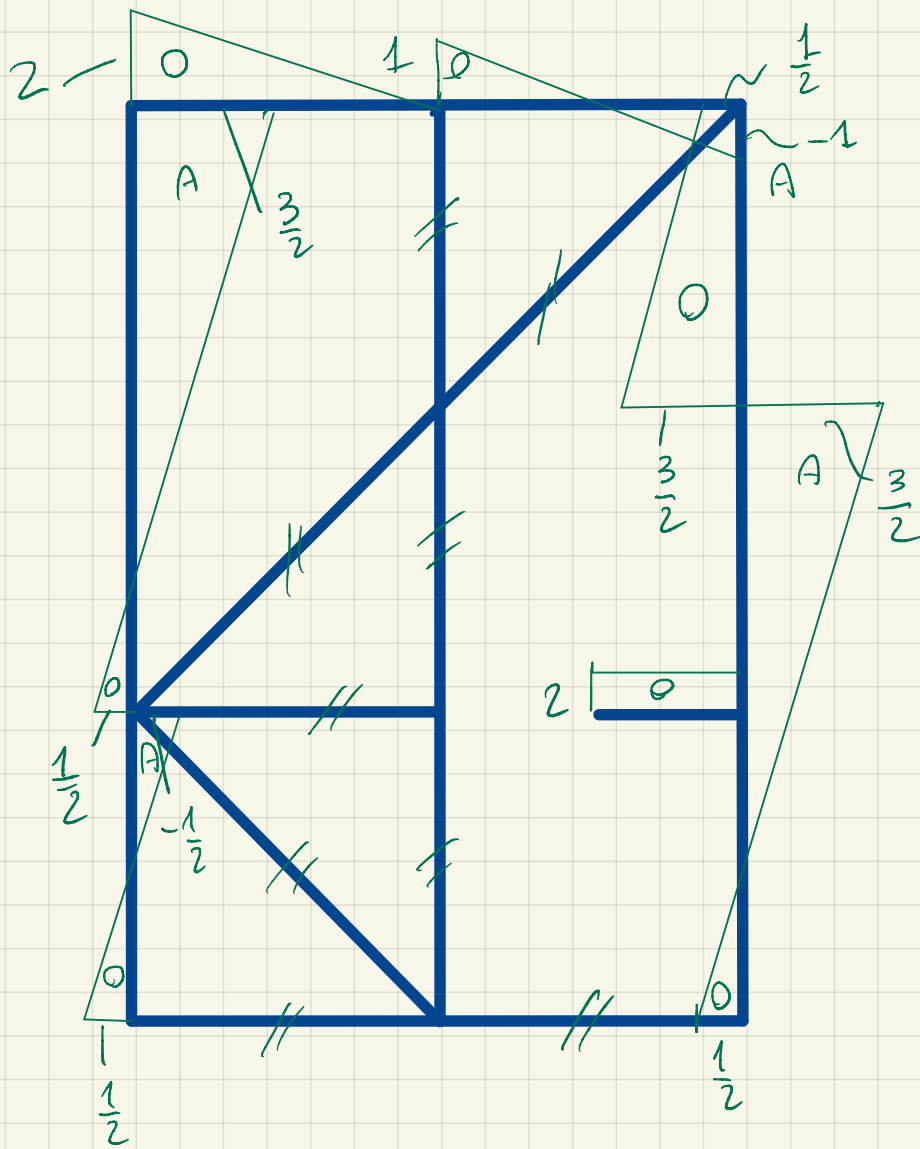
Nodo E



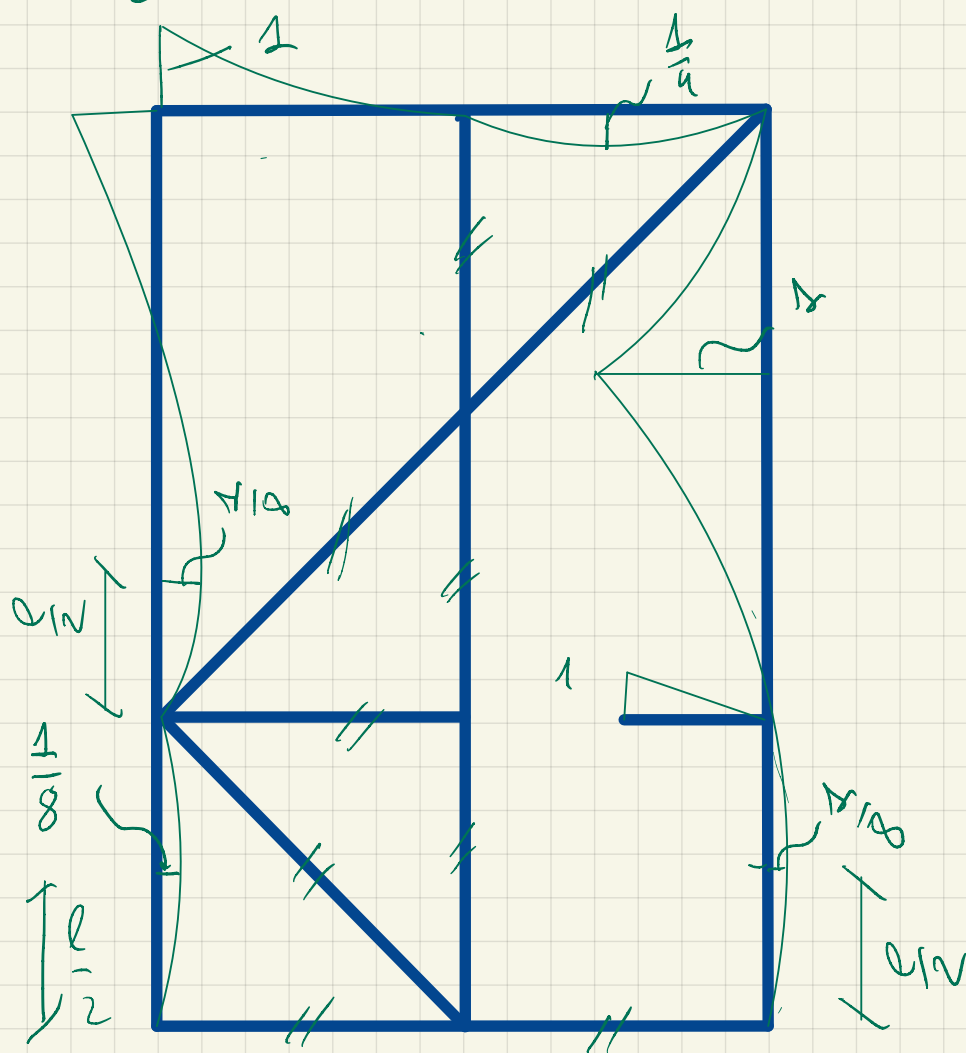
Nodo D



$$\frac{N}{p\ell}$$



$$\frac{T}{pl}$$



$$\frac{T}{pl^2}$$