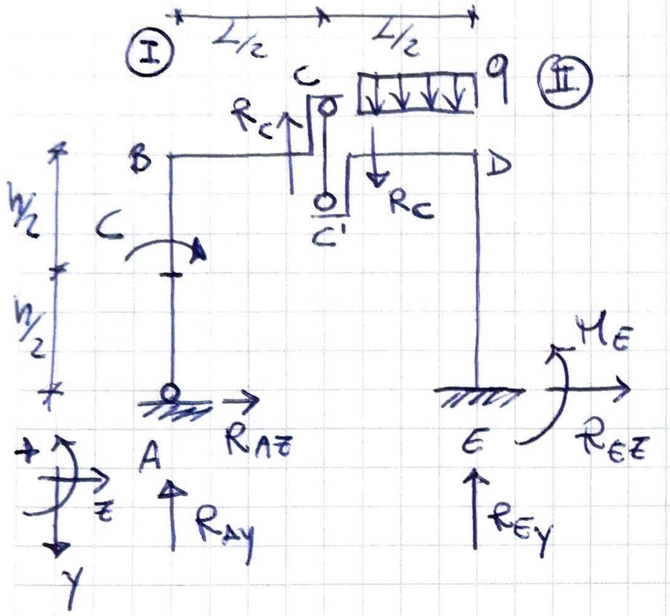
Esercizio (1) - Problema statico




I tronco

$\downarrow)\ -R_{Ay} - R_C = 0$

$\rightarrow)\ R_{Az} = 0$

$A\circlearrowright)\ -C + R_C \cdot \frac{L}{2} = 0$

II tronco

$\downarrow)\ +R_C + q\frac{L}{2} - R_{Ey} = 0$

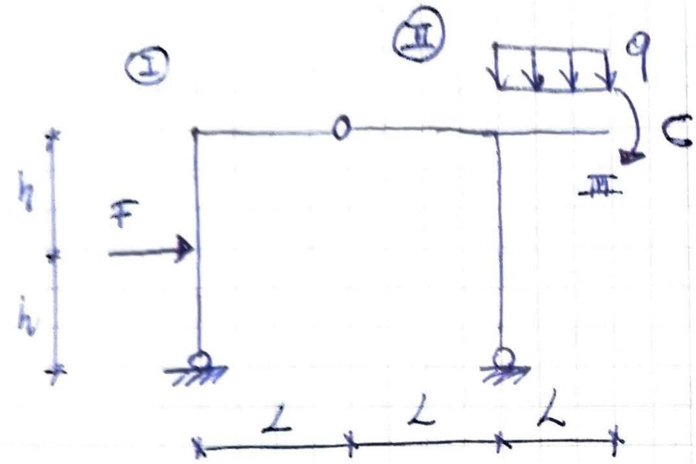
$\rightarrow)\ R_{Ez} = 0$

$E\circlearrowright)\ R_C \cdot \frac{L}{2} + q \cdot \frac{L}{2} \cdot \frac{L}{4} + M_E = 0$

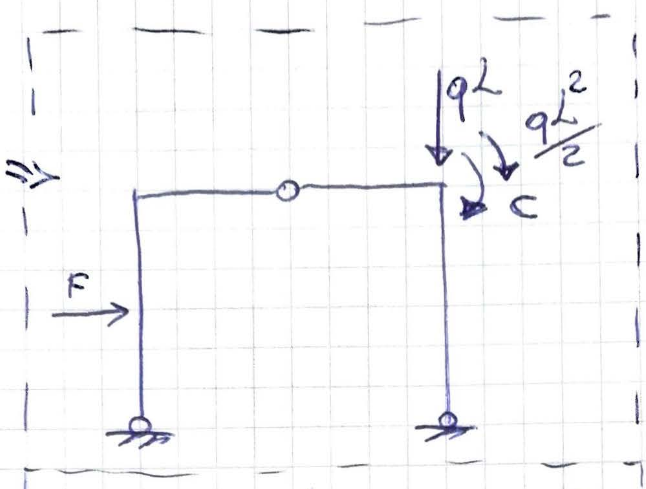
$$\begin{bmatrix} -1 & 0 & -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & L/2 & 0 & 0 & 0 \\ 0 & 0 & 1 & -1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & L/2 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} R_{Ay} \\ R_{Az} \\ R_C \\ R_{Ey} \\ R_{Ez} \\ M_E \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ -C \\ qL/2 \\ 0 \\ qL^2/8 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\underline{\underline{S}}\,\underline{r} + \underline{f} = 0$$

## Esercizio (2) - Nodo triplo

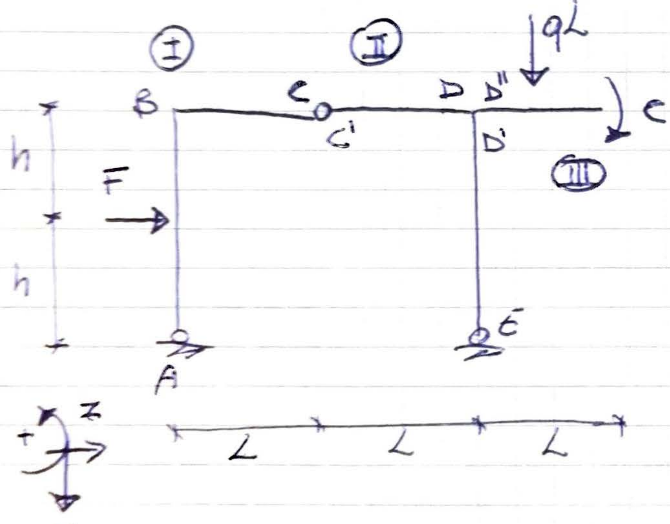


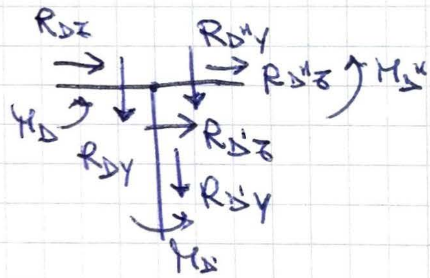

⇒




si può risolvere come prima

- Oppure si può considerare il III tronco con vincolo incastro



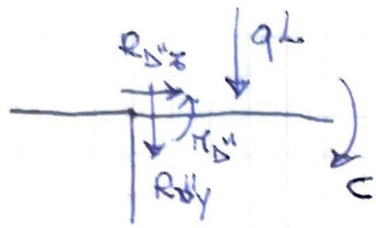

$$
\begin{cases}
\downarrow)\; R_{Dy} + R_{D'y} + R_{D''y} = 0 \\
\rightarrow)\; R_{Dz} + R_{D'z} + R_{D''z} = 0 \\
+\curvearrowright)\; M_D + M_{D'} + M_{D''} = 0
\end{cases}
$$

$$
\begin{cases}
R_{D''y} = -R_{Dy} - R_{D'y} \\
R_{D''z} = -R_{Dz} - R_{D'z} \\
M_{D''} = -M_D - M_{D'}
\end{cases}
$$

$\Rightarrow m(n-1)$ reazioni incognite

$n$ = numero di tronchi che confluiscono nel nodo

$m$ = molteplicità del vincolo interno




$$
\begin{cases}
\downarrow)\ R_{D''y} + qL = 0 \quad \Rightarrow R_{D''y} = -qL \\
\rightarrow)\ R_{D''z} = 0 \\
+\circlearrowleft)\ M_{D''} - \dfrac{qL^2}{2} - C = 0 \quad \Rightarrow M_{D''} = C + \dfrac{qL^2}{2}
\end{cases}
$$

tornando alle equazioni precedenti e sostituendo $R_{D''y}$, $R_{D''z}$ e $M_{D''}$ si ha:

$$
\begin{cases}
-qL = -R_{Dy} - R_{D'y} \\
-R_{Dz} - R_{D'z} = 0 \\
C + \dfrac{qL^2}{2} = -M_D - M_{D'}
\end{cases}
\Rightarrow
\begin{cases}
R_{Dy} = qL - R_{D'y} \\
R_{Dz} = -R_{D'z} \\
M_D = -C - \dfrac{qL^2}{2} - M_{D'}
\end{cases}
$$