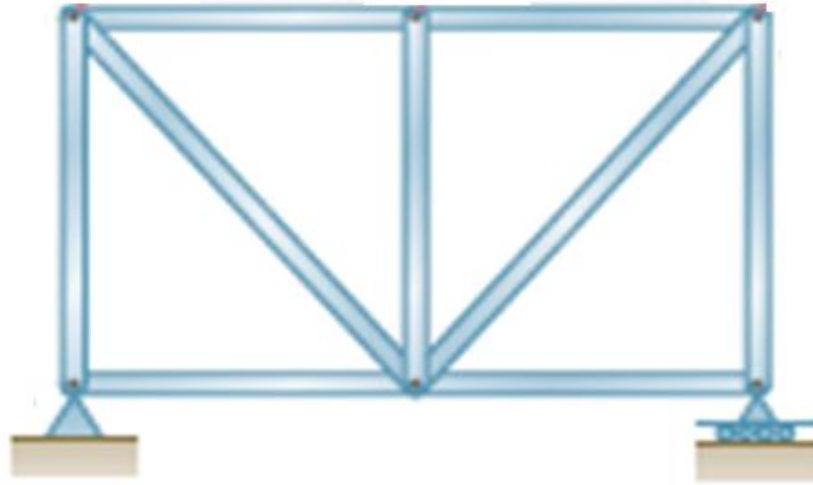


RETICULADOS

Reticulados - Introducción

Definición:

Estructuras formadas por **barras rectas** unidas en sus extremos mediante **articulaciones** (nudos).



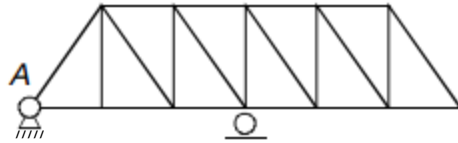
Supondremos válidas las siguientes **hipótesis**:

Las **fuerzas** actúan solamente **sobre los nudos**

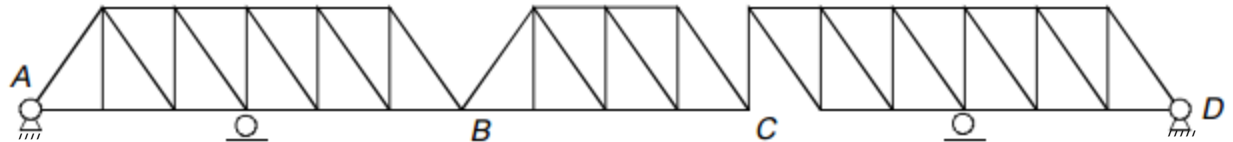
Los nudos son **articulaciones perfectas**.

Clasificación

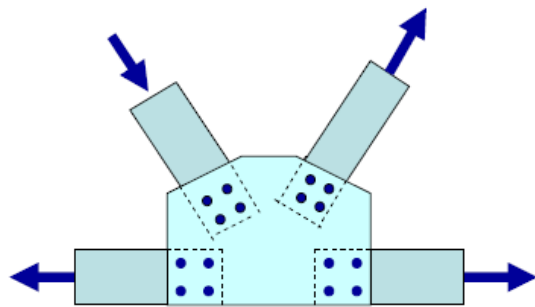
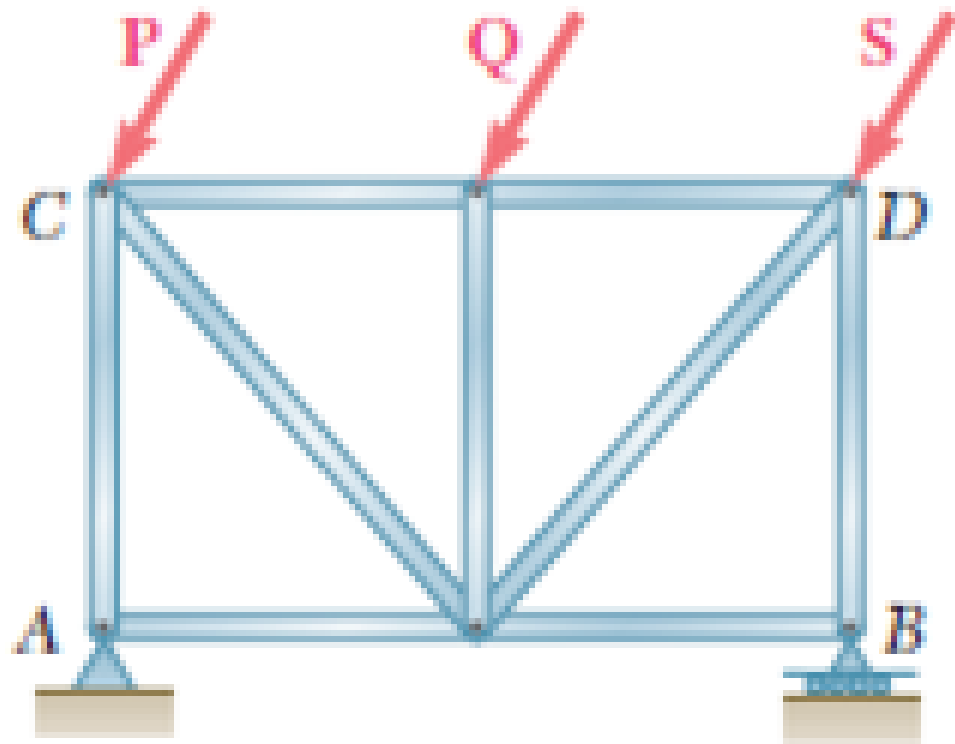
- Simples

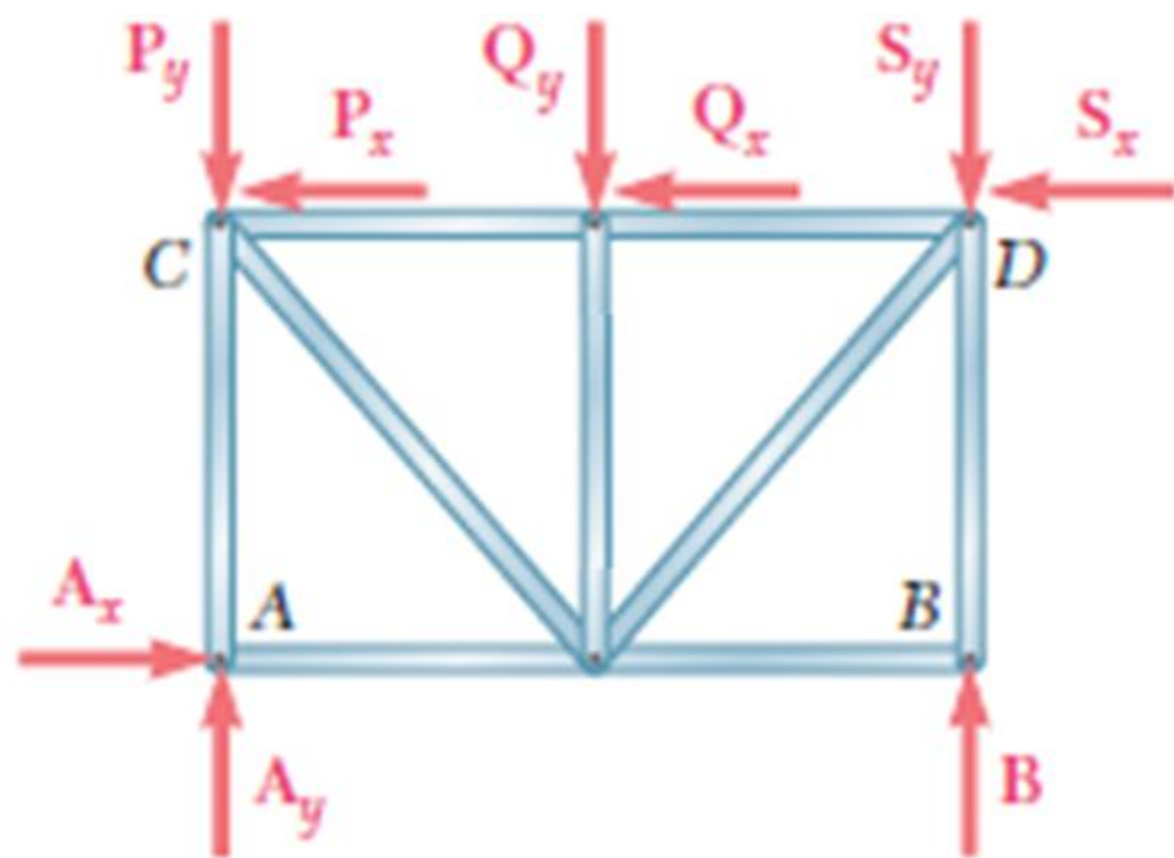


- Compuestos

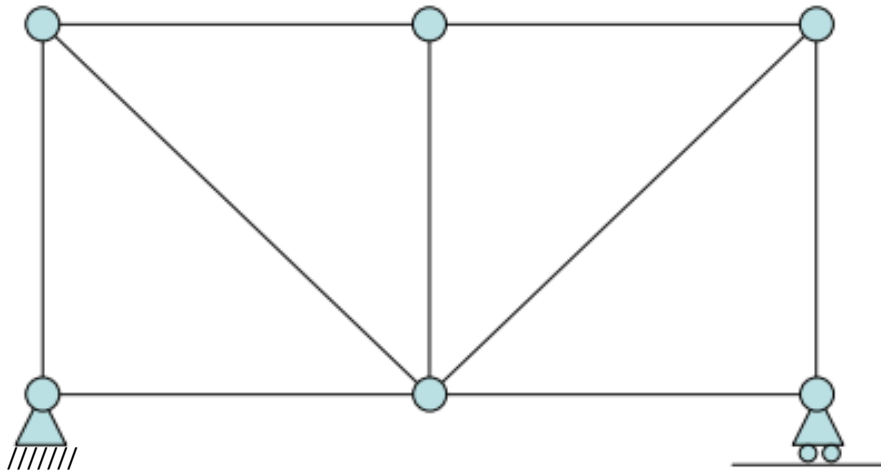


- Complejos





Condición de Isoestaticidad



$$2 * n = b$$

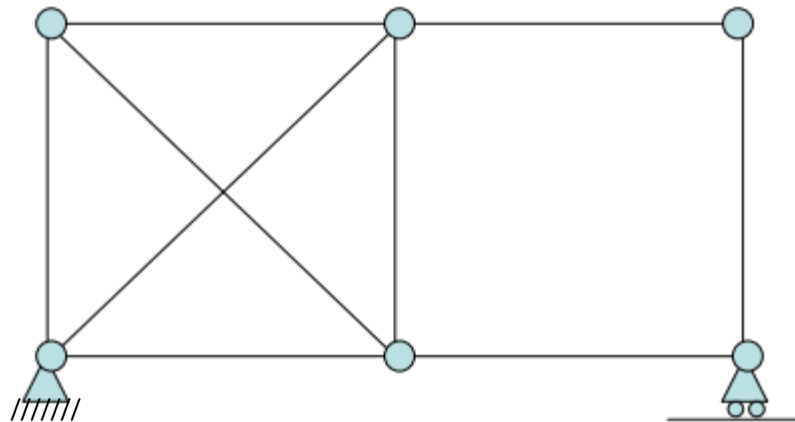
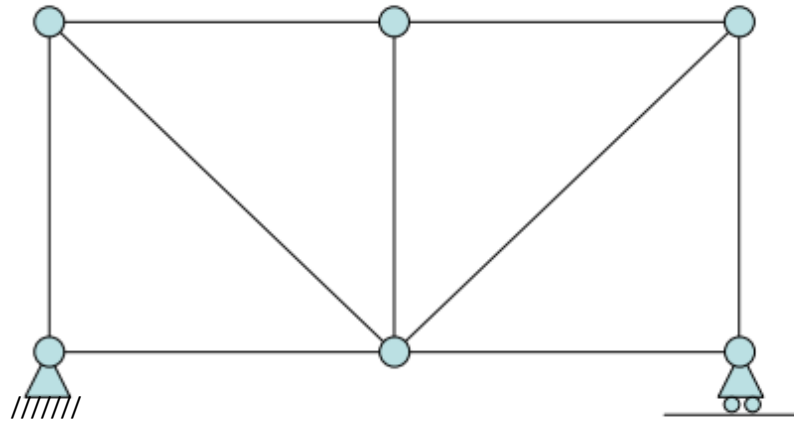
n: número de nudos

b: número de barras

Apoyo fijo → 2 barras

Apoyo desl. → 1 barra

Necesaria pero no suficiente

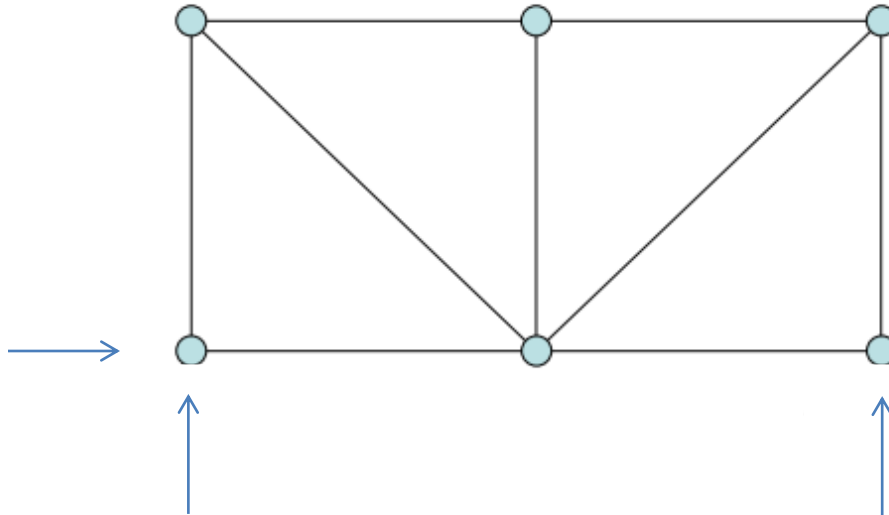


Clasificación – por construcción

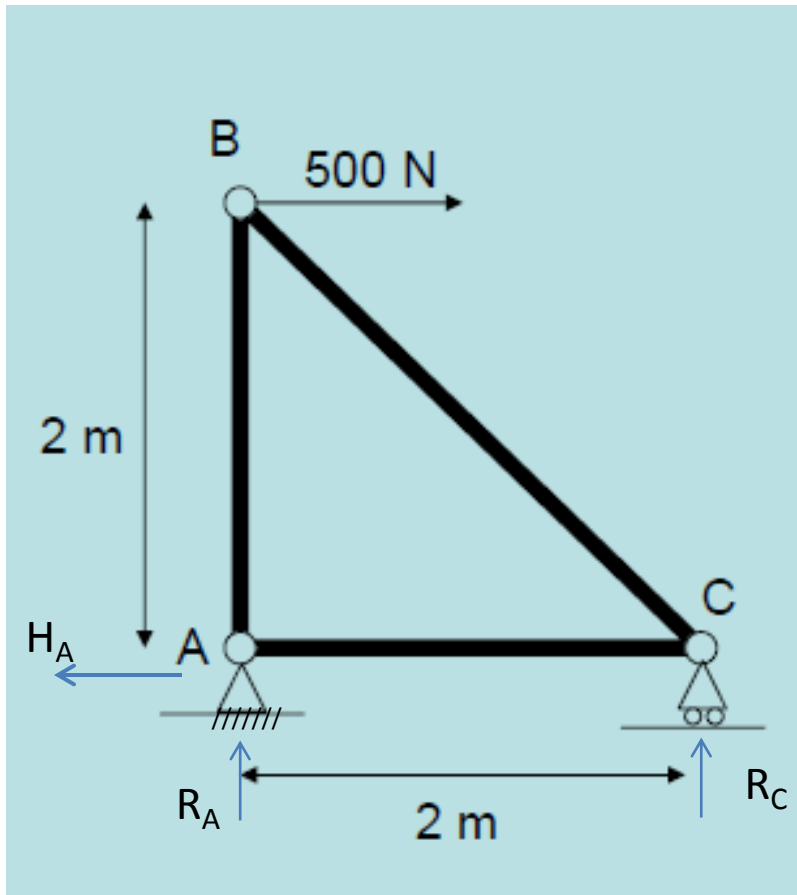
Reticulados simples:

Se parte de 3 barras unidas por 3 articulaciones. Luego, cada nuevo nodo es vinculado por 2 barras al reticulado existente.

(A los nudos unidos sólo por dos barras se los denomina: *nudos canónicos*)



Equilibrio de nudos



$$\text{Suma } (F_V) = 0$$

$$\text{Suma } (F_H) = 0$$

$$\text{Suma } (M_A) = 0$$

$$R_A + R_C = 0$$

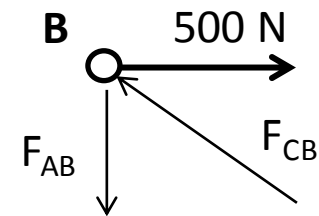
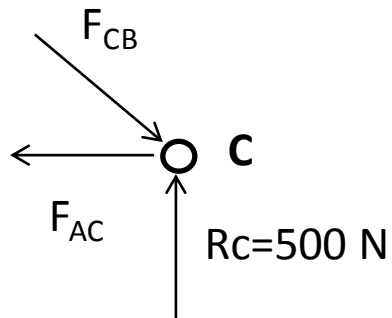
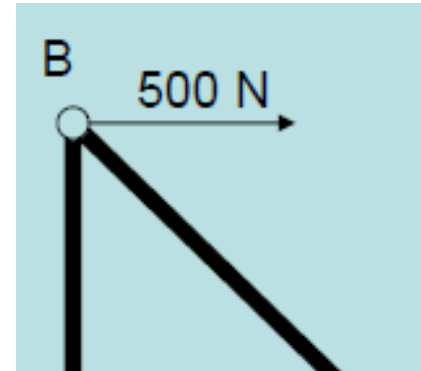
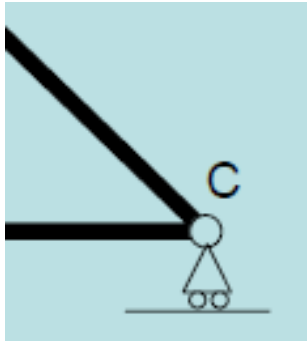
$$H_A = 500 \text{ N}$$

$$2 \cdot 500 - 2 \cdot R_C = 0$$

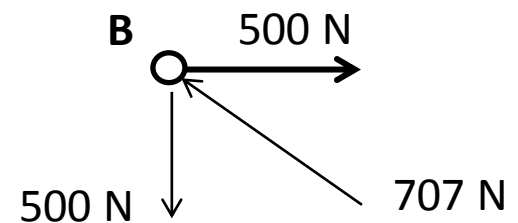
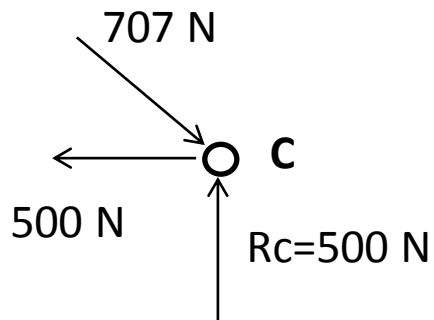
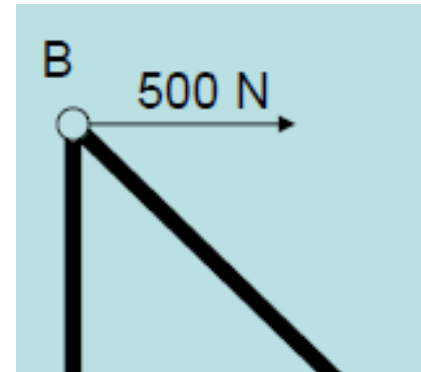
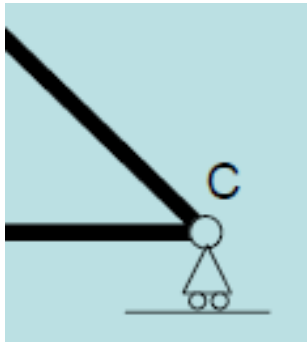
$$R_C = 500 \text{ N}$$

$$R_A = -500 \text{ N}$$

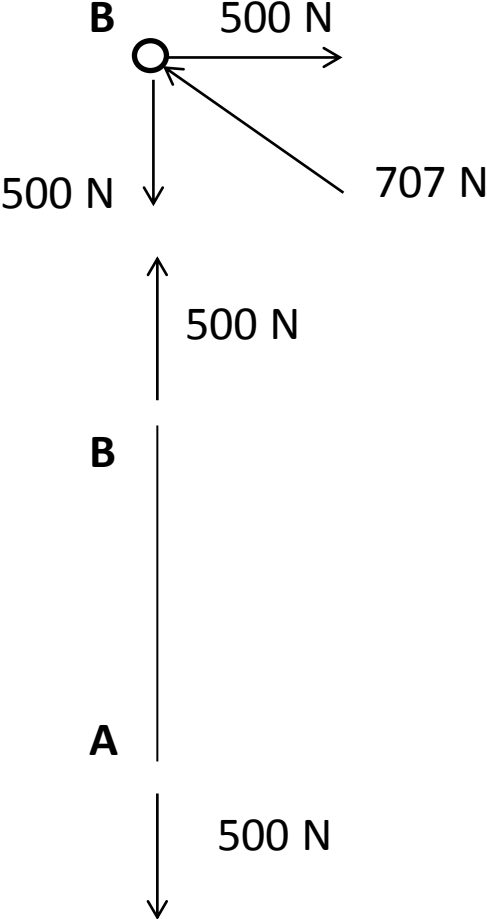
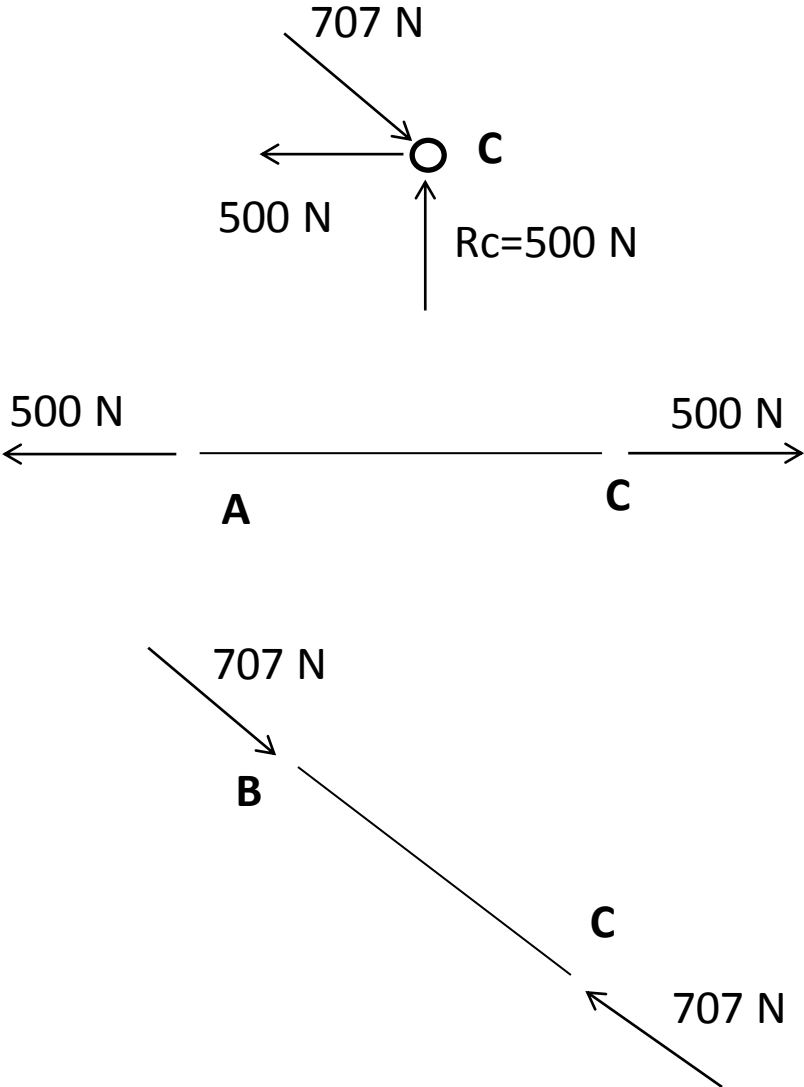
Equilibrio de nudos



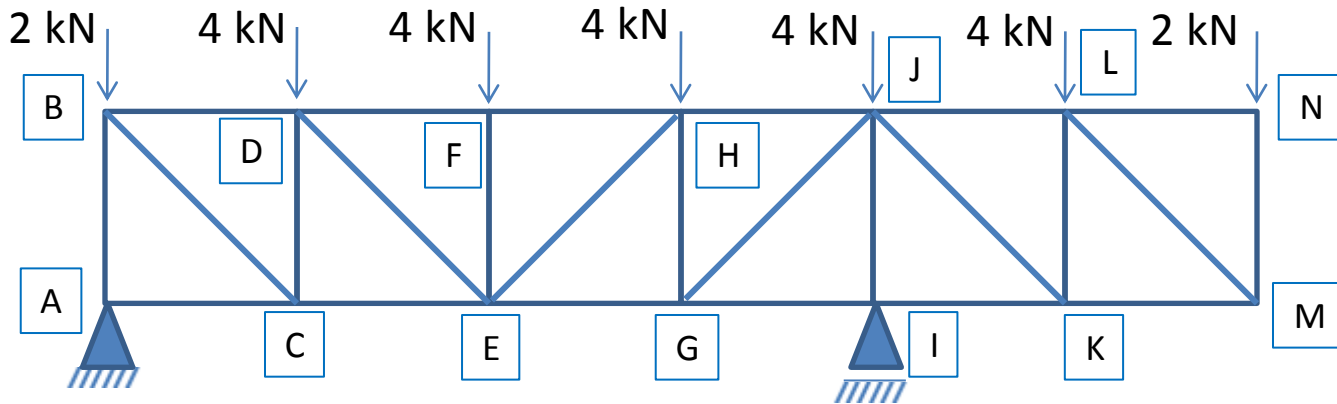
Equilibrio de nudos



Equilibrio de nudos

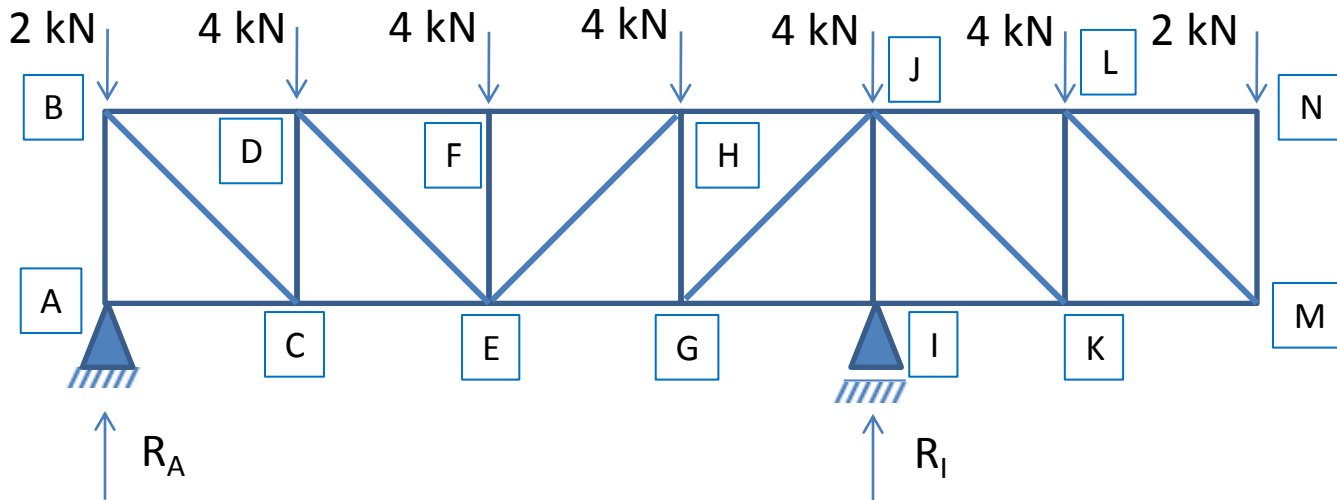


Ejemplo



- Calcular Reacciones
- Fuerza en todas las barras

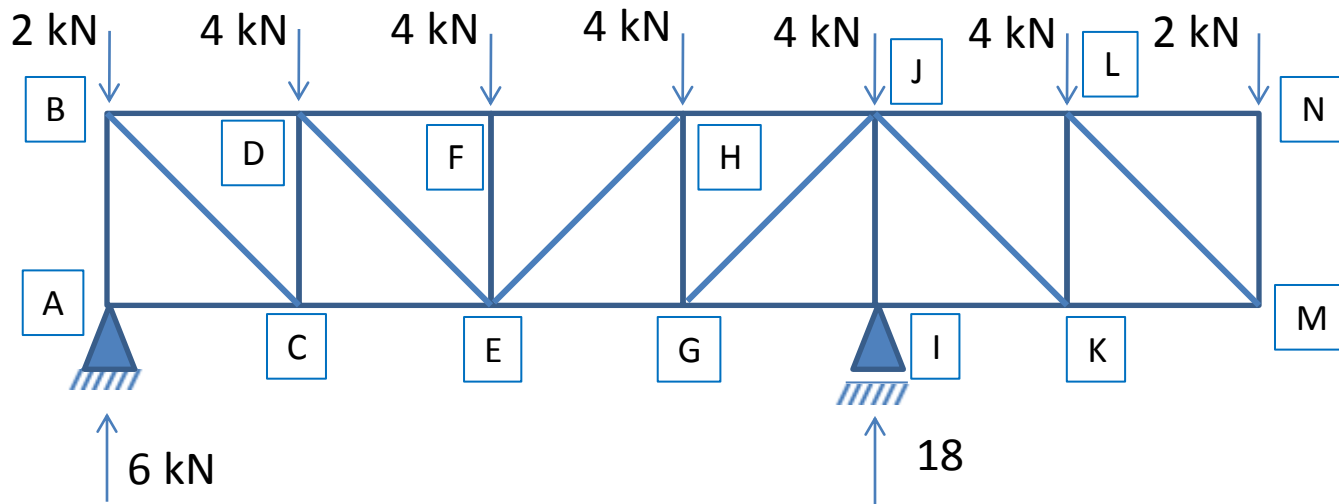
Ejemplo



Reacciones

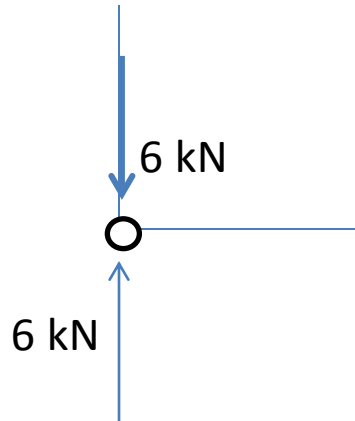
$$\text{Suma}(M_A)=0 \quad 4 \cdot L+4 \cdot 2L+4 \cdot 3L+4 \cdot 4L+4 \cdot 5L+2 \cdot 6L-R_I \cdot 4L=0$$
$$R_I \cdot 4L=72 \cdot L \rightarrow R_I=18 \text{ kN}$$

$$\text{Suma}(FV)=0 \quad R_A+R_I=24 \text{ kN} \quad \text{Suma}(FH)=0$$

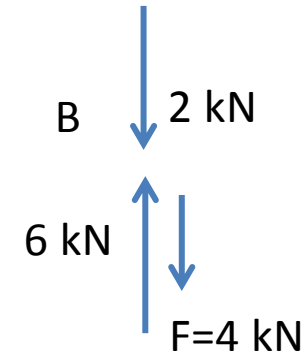
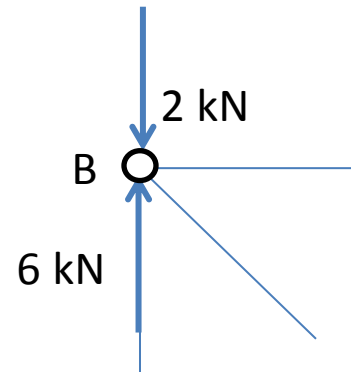


Equilibrio en Nudos

Nudo A

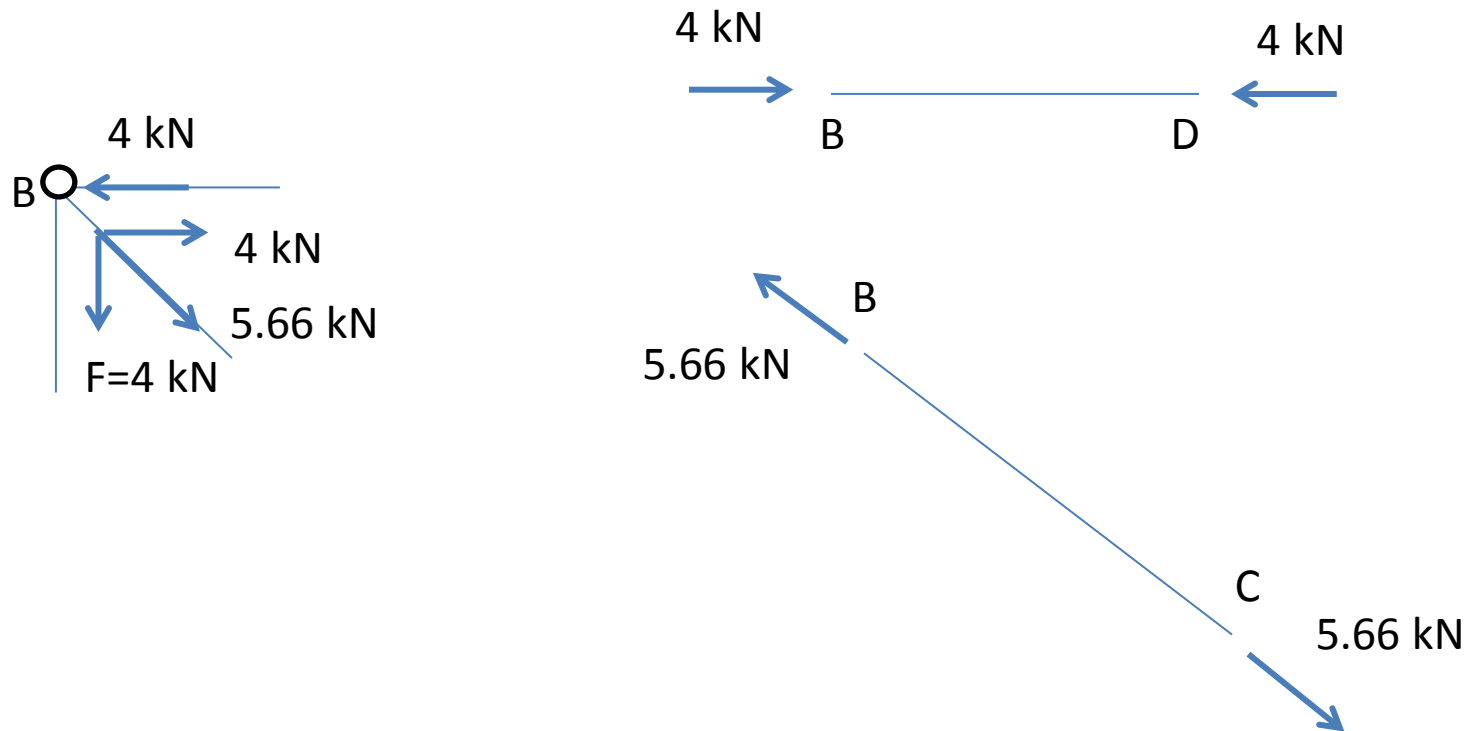


Nudo B



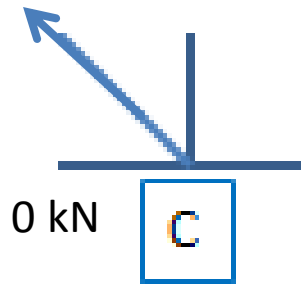
Equilibrio en Nudos

Nudo B

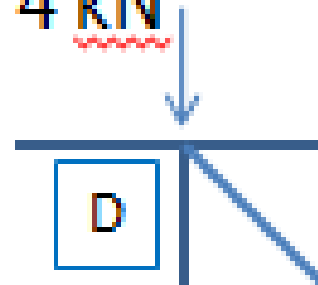


Equilibrio en Nudos

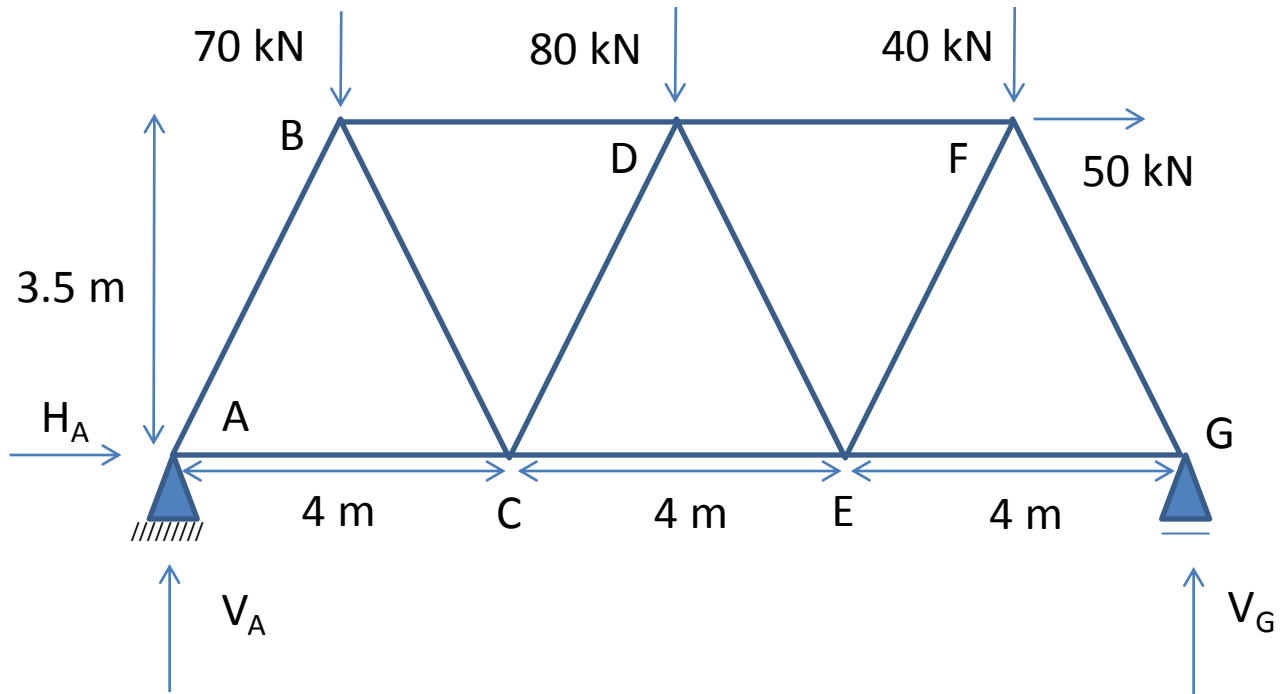
5.66 kN



4 kN



Reticulado Simple



Precedimiento

- Identificar simetrías
- Identificar las barras que no llevan esfuerzos
- Comenzar por los nudos canónicos (equilibrio)
- Plantear las ecuaciones de equilibrio de cada nudo