

## Análisis estructural .-Tema 6

**Problemas.-** Con el uso del método de los nodos, determine la fuerza en cada uno de los elementos de las armaduras mostradas en las siguientes figuras.

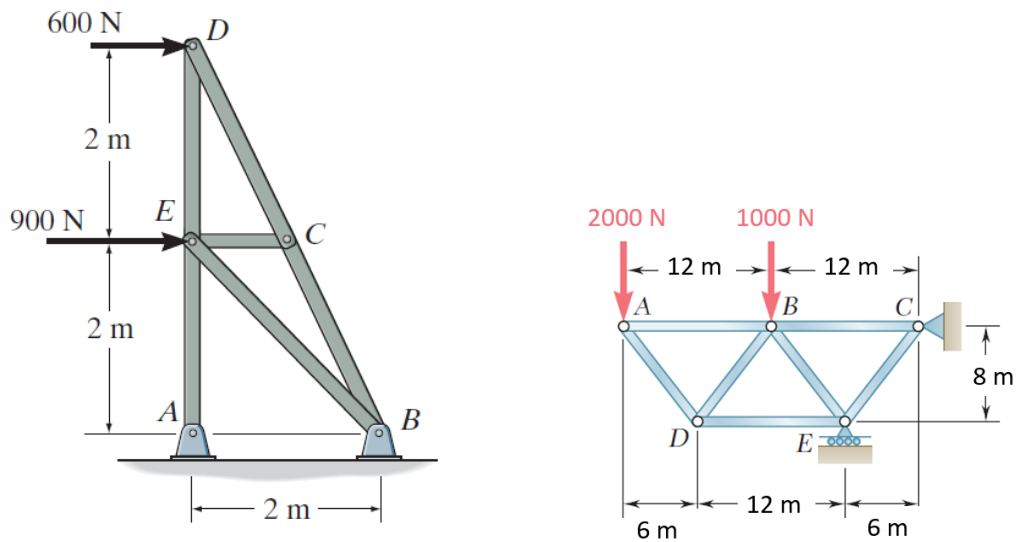


Figura 1: Problemas 1 y 2

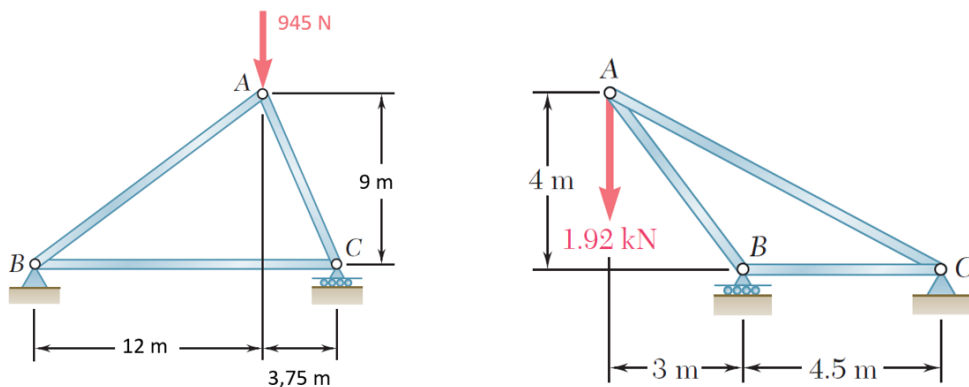


Figura 2: Problemas 3 y 4

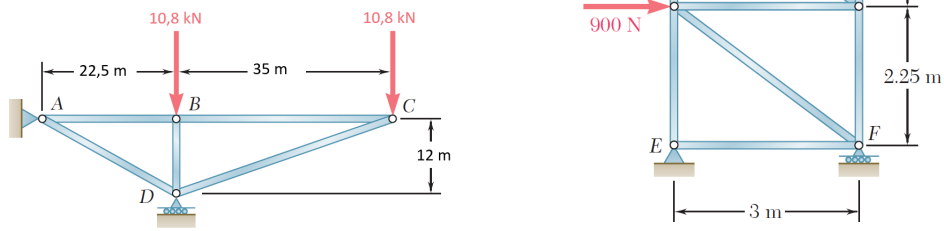


Figura 3: Problemas 5 y 6

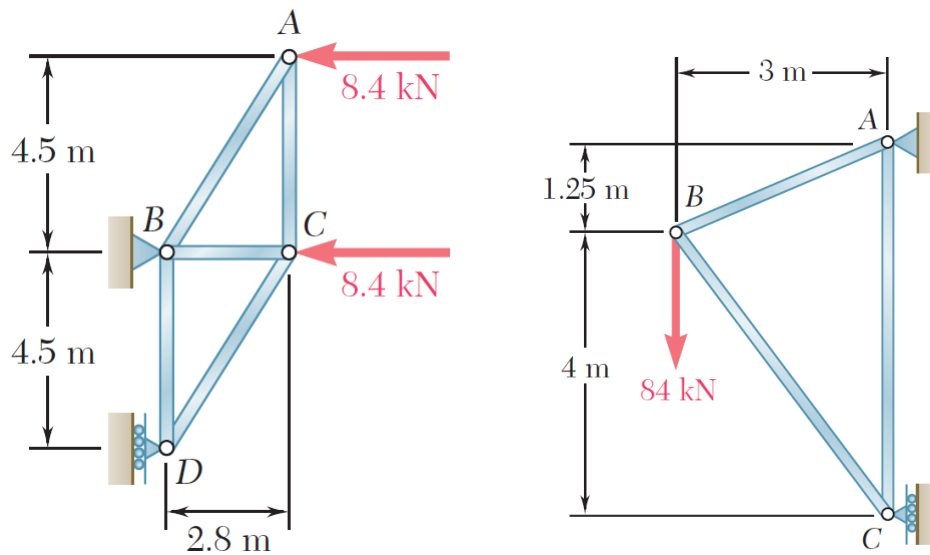


Figura 4: Problemas 7 y 8

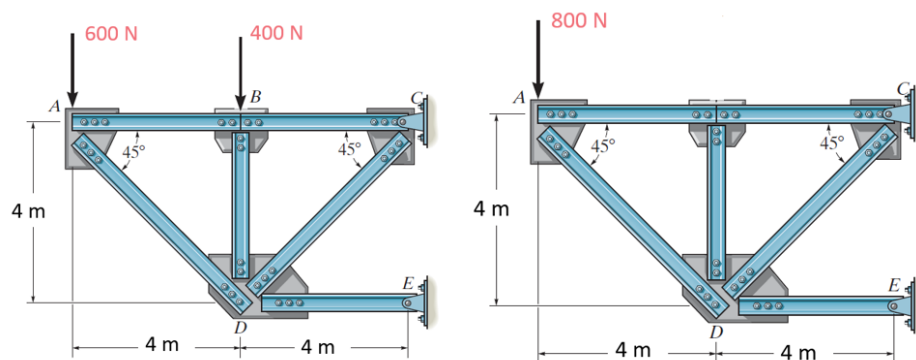


Figura 5: Problemas 9 y 10

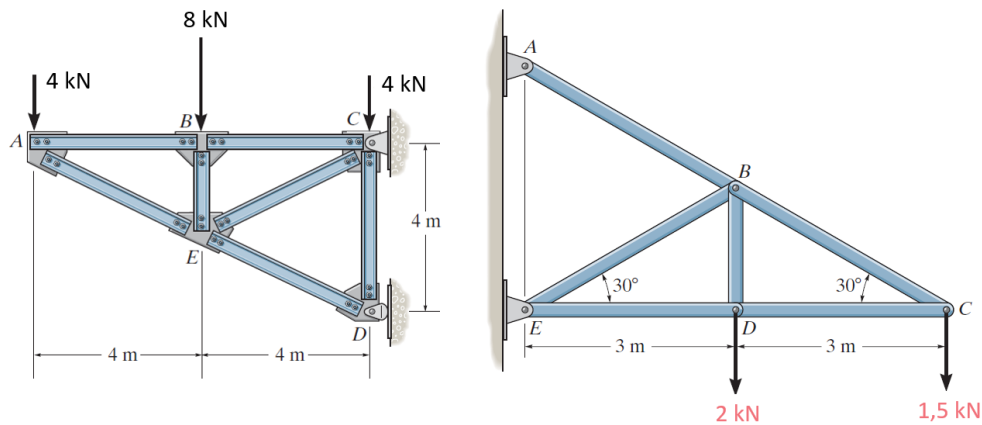


Figura 6: Problemas 11 y 12

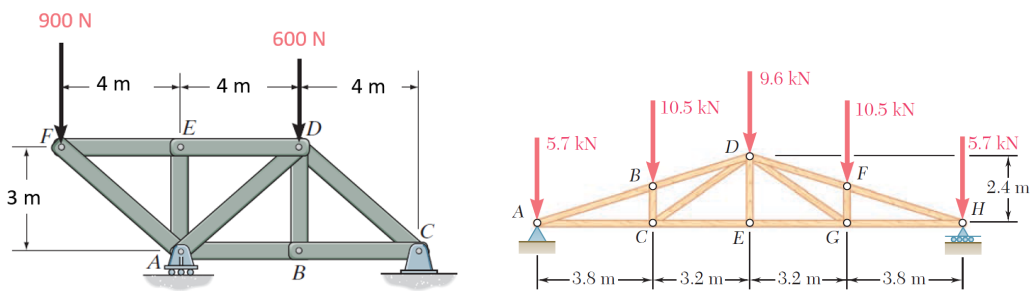


Figura 7: Problemas 13 y 14

## Soluciones:

**Problema 1.-**  $F_{BD} = 1,34 \text{ kN (C)}$  ,  $F_{DE} = 1,20 \text{ kN (T)}$  ,  $F_{BE} = 1,27 \text{ kN (C)}$  ,  $F_{AE} = 2,10 \text{ kN (T)}$

**Problema 2.-**  $\vec{F}_E = 10000 \text{ N } \vec{j}$ ,  $\vec{C} = (0\vec{i} - 7000\vec{j}) \text{ N}$ ,  $F_{AB} = 1500 \text{ N (T)}$  ,  $F_{AD} = 2500 \text{ N (C)}$  ,  $F_{DB} = 2500 \text{ N (T)}$  ,  $F_{DE} = 3000 \text{ N (C)}$

**Problema 3.-**  $F_{AB} = 375 \text{ N (C)}$  ,  $F_{AC} = 780 \text{ N (C)}$  ,  $F_{DB} = 300 \text{ N (T)}$

**Problema 4.-**  $F_{AB} = 4,00 \text{ kN (C)}$  ,  $F_{AC} = 2,72 \text{ kN (T)}$  ,  $F_{BC} = 2,40 \text{ N (C)}$

**Problema 5.-**  $F_{AB} = 31,5 \text{ kN (T)}$  ,  $F_{AD} = 35,7 \text{ kN (C)}$  ,  $F_{BC} = 31,5 \text{ N (T)}$

**Problema 6.-**  $F_{AB} = F_{BD} = 0$ ;  $F_{AC} = 675 \text{ N (T)}$ ;  $F_{AD} = 1125 \text{ N (C)}$ ;  $F_{CD} = 900 \text{ N (T)}$ ;  $F_{CE} = 2025 \text{ N (T)}$ ;  $F_{CF} = 2250 \text{ N (C)}$

**Problema 7.-**  $F_{AB} = 15,90 \text{ kN (C)}$ ;  $F_{AC} = 13,50 \text{ kN (T)}$ ;  $F_{BC} = 16,80 \text{ kN (C)}$ ;  $F_{BD} = 13,50 \text{ kN (C)}$ ;  $F_{CD} = 15,90 \text{ kN (T)}$

**Problema 8.-**  $F_{AB} = 52,0 \text{ kN (T)}$ ;  $F_{AC} = 64,0 \text{ kN (T)}$ ;  $F_{BC} = 80,0 \text{ kN (C)}$

**Problema 9.**  $-F_{AB} = 600N(T); F_{AD} = 849N(C); F_{BD} = 400kN(C); F_{BC} = 600kN(T); F_{DC} = 1131 kN (T); F_{DE} = 1600 kN (C)$

**Problema 10.**  $-F_{AB} = 800 N (T); F_{AD} = 1131 N (C); F_{BD} = 0; F_{BC} = 800 N (T); F_{DC} = 1414 N (T); F_{DE} = 1600 N (C)$

**Problema 11.**  $-F_{AB} = 8,00 kN (T); F_{AE} = 8,94 kN (C); F_{BC} = 8,00 kN (T); F_{BE} = 8,00 kN (C); F_{EC} = 8,94 kN (T); F_{DE} = 17,9 kN (C); F_{DC} = 8,00 kN (C); D_x = 16 kN$

**Problema 12.**  $-F_{AB} = 5 kN (T); F_{BC} = 3 kN (T); F_{BD} = 2 kN (T); F_{BE} = 2 kN (C); F_{CD} = 2,6 kN (C); F_{DE} = 2,6 kN (C)$

**Problema 13.**  $-N_A = 1650 N ; F_{FA} = 1500 N (C); F_{FE} = 1200 N (T); F_{EA} = 0; F_{AD} = 1250 N (C); F_{AB} = 200 N (C); F_{BC} = 200 N (C); F_{BD} = 0; F_{DC} = 250 N (T)$

**Problema 14.**  $-F_{AB} = 47,2 kN (C); F_{AC} = 44,6 kN (T); F_{BC} = 10,50 kN (C); F_{BD} = 47,2 kN (C); F_{CD} = 17,50 kN (T); F_{CE} = 30,6 kN (T); F_{DE} = 0.$