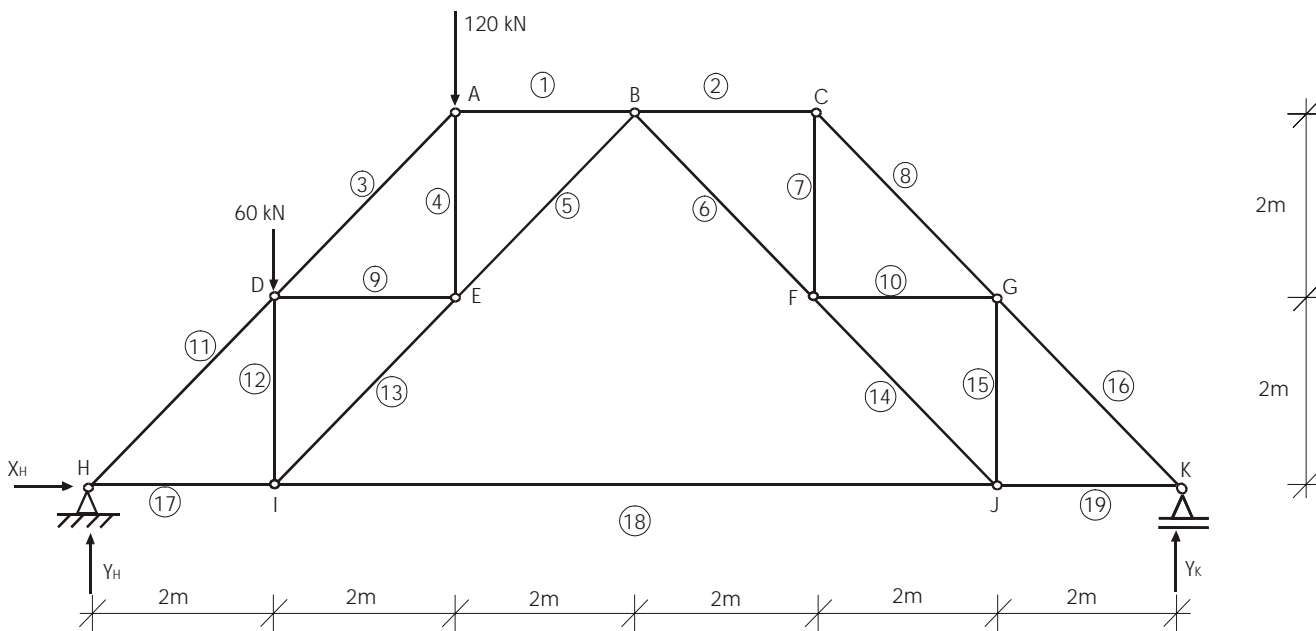


NºUSP: _____ Nome: _____

Questão 2 (3,0)

Para a treliça da figura, determinar:

- a) as reações de apoio;
- b) as forças normais nas barras 2, 6, 7, 8 e 18.



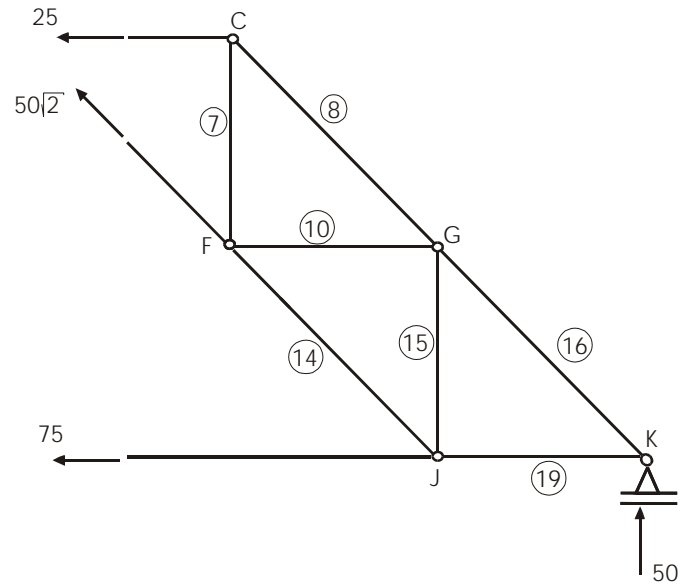
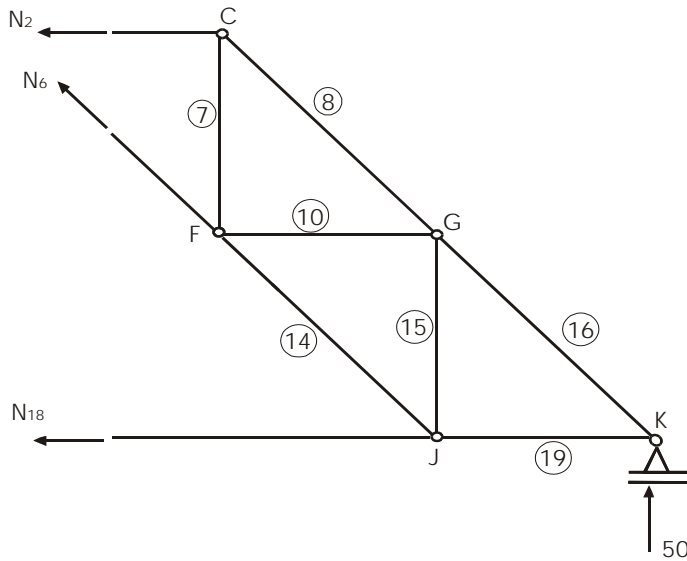
Solução:

$$\begin{aligned}
 \text{a) } \sum X = 0 & \quad X_H = 0 \\
 \sum Y = 0 & \quad Y_H + Y_K = 60 + 120 = 180 \\
 \sum M_H = 0 & \quad -60 \cdot 2 - 120 \cdot 4 + Y_K \cdot 12 = 0
 \end{aligned}$$

$$Y_K = 50 \text{ kN}$$

$$Y_H = 180 - 50 = 130 \text{ kN}$$

b) Determinação de N_2 , N_6 e N_{18} pelo método de Ritter

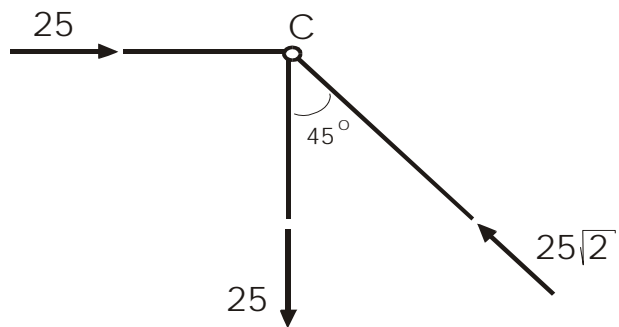
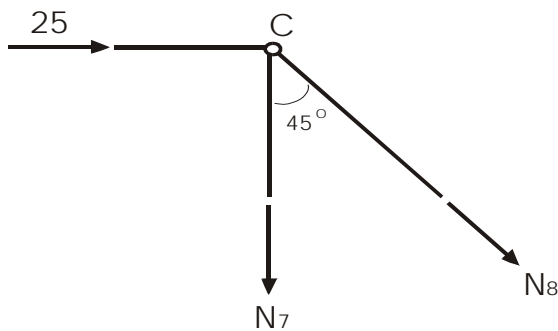


$$\sum M_J = 0 \quad N_2 \cdot 4 + 50 \cdot 2 = 0 \quad N_2 = -25$$

$$\sum Y = 0 \quad N_6 \cdot \frac{\sqrt{2}}{2} + 50 = 0 \quad N_6 = -50\sqrt{2}$$

$$\sum X = 0 \quad -N_2 - N_6 \cdot \frac{\sqrt{2}}{2} - N_{18} = 0 \quad N_{18} = 25 + 50 \cdot \sqrt{2} \cdot \frac{\sqrt{2}}{2} = 75$$

Equilíbrio do nó C:



$$\sum X = 0 \quad 25 + N_8 \cdot \frac{\sqrt{2}}{2} = 0 \quad N_8 = -25\sqrt{2}$$

$$\sum Y = 0 \quad -N_7 - N_8 \cdot \frac{\sqrt{2}}{2} = 0 \quad N_7 = 25 \cdot \sqrt{2} \cdot \frac{\sqrt{2}}{2} = 25$$

Resposta: $N_2 = -25 \text{ kN}$

$$N_6 = -50\sqrt{2} \text{ kN}$$

$$N_7 = 25 \text{ kN}$$

$$N_8 = -25\sqrt{2} \text{ kN}$$

$$N_{18} = 75 \text{ kN}$$