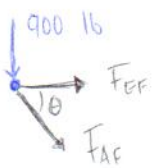


$$\theta = \tan^{-1}\left(\frac{3}{4}\right) = 36.87^\circ$$

① Analizando el nodo F



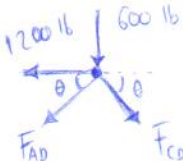
$$\begin{aligned} \uparrow \sum F_y = 0; & -900 - F_{AF} \sin \theta = 0 \\ F_{AF} &= -\frac{900}{\sin \theta} = -1500 \text{ lb} \\ \rightarrow \sum F_x = 0; & F_{FF} + F_{AF} \cos \theta = 0 \\ \therefore F_{FF} &= -F_{AF} \cos \theta = 1200 \text{ lb} \end{aligned}$$

$$F_{AF} = 1500 \text{ lb } (\odot)$$

$$F_{FF} = 1200 \text{ lb } (\oplus)$$

Analizando el nodo D: Por inspección en B sabemos que:

$$F_{BD} = 0$$



$$\begin{aligned} \rightarrow \sum F_x = 0; & -1200 - F_{AD} \cos \theta + F_{CD} \cos \theta = 0 \\ -0.8 F_{AD} + 0.8 F_{CD} &= 1200 \quad \dots (i) \end{aligned}$$

$$\uparrow \sum F_y = 0; -600 - F_{AD} \sin \theta - F_{CD} \sin \theta = 0$$

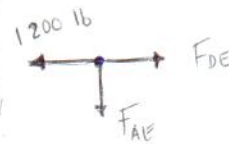
$$-0.6 F_{AD} - 0.6 F_{CD} = 600 \quad \dots (ii)$$

$$\text{Resolviendo para } F_{AD} \text{ y } F_{CD} \rightarrow F_{AD} = -1250 \text{ lb} \quad F_{CD} = 250 \text{ lb}$$

$$\therefore F_{AD} = 1250 \text{ lb } (\odot)$$

$$F_{CD} = 250 \text{ lb } (\oplus)$$

Analizando el nodo E:



$$\begin{aligned} \uparrow \sum F_y = 0; & -F_{AE} = 0 \\ \therefore F_{AE} &= 0 \end{aligned}$$

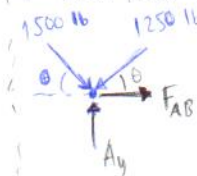
$$\rightarrow \sum F_x = 0; -1200 + F_{DE} = 0$$

$$\therefore F_{DE} = 1200 \text{ lb}$$

$$F_{AE} = 0$$

$$F_{DE} = 1200 \text{ lb } (\oplus)$$

Analizando el nodo A:

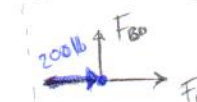


$$\rightarrow \sum F_x = 0; 1500 \cos \theta - 1250 \cos \theta + F_{AB} = 0$$

$$\therefore F_{AB} = -1500(0.8) + 1250(0.8)$$

$$\therefore F_{AB} = -200 \text{ lb} \quad F_{AB} = 200 \text{ lb } (\odot)$$

Analizando el nodo B



$$\uparrow \sum F_y = 0; F_{BD} = 0$$

$$\rightarrow \sum F_x = 0; +200 + F_{BC} = 0$$

$$\therefore F_{BC} = -200 \text{ lb}$$

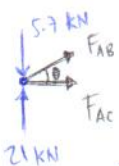
$$F_{BD} = 0$$

$$F_{BC} = 200 \text{ lb } (\odot)$$

② Por simetría de la carga y geometría de la estructura \rightarrow

$$A_y = 21 \text{ kN} \quad A_x = 0 \quad H_y = 21 \text{ kN} \quad \phi = 36.87^\circ$$

Analizando el nodo A: $\theta = \tan^{-1}\left(\frac{2.4}{7}\right) = 18.92^\circ$



$$\uparrow \sum F_y = 0; -5.7 + 21 + F_{AB} \sin \theta = 0$$

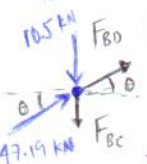
$$F_{AB} = \frac{5.7 - 21}{\sin \theta} = -47.19 \text{ kN}$$

$$\rightarrow \sum F_x = 0; F_{AB} \cos \theta + F_{AC} = 0$$

$$\therefore F_{AC} = -F_{AB} \cos \theta = 44.64 \text{ kN}$$

$$F_{AB} = 47.19 \text{ kN } (\odot) \quad F_{AC} = 44.64 \text{ kN } (\oplus)$$

Analizando el nodo B



$$\rightarrow \sum F_x = 0; 47.19 \cos \theta + F_{BD} \cos \theta = 0$$

$$F_{BD} = -47.19 \text{ kN}$$

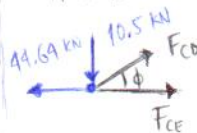
$$\uparrow \sum F_y = 0; -10.5 - F_{BC} + 47.19 \sin \theta + F_{BD} \sin \theta = 0$$

$$\therefore F_{BC} = -10.5 + 47.19 \sin \theta + F_{BD} \sin \theta$$

$$\therefore F_{BC} = -10.5 \text{ kN}$$

$$F_{BD} = 47.19 \text{ kN } (\odot) \quad F_{BC} = 10.5 \text{ kN } (\odot)$$

Analizando el nodo C



$$\uparrow \sum F_y = 0; -10.5 + F_{CD} \sin \phi = 0$$

$$F_{CD} = \frac{10.5}{\sin \phi} = 17.5 \text{ kN}$$

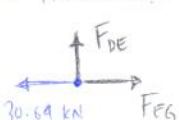
$$F_{CD} = 17.5 \text{ kN } (\oplus)$$

$$F_{CE} = 30.64 \text{ kN } (\oplus)$$

$$\rightarrow \sum F_x = 0; -44.64 + F_{CD} \cos \phi + F_{CE} = 0$$

$$F_{CE} = 44.64 - F_{CD} \cos \phi = 30.64 \text{ kN}$$

Analizando el nodo E:



$$\uparrow \sum F_y = 0; F_{DE} = 0$$

$$\rightarrow \sum F_x = 0; -30.64 + F_{EG} = 0$$

$$F_{DE} = 0$$

$$F_{EG} = 30.64 \text{ kN } (\oplus)$$

$$\therefore F_{EG} = 30.64 \text{ kN}$$

Por simetría de las cargas y geometría de la estructura, se tiene:

$$F_{DE} = F_{BD} = 47.19 \text{ kN } (\odot)$$

$$F_{DG} = F_{CD} = 17.5 \text{ kN } (\oplus)$$

$$F_{EG} = F_{BC} = 10.5 \text{ kN } (\odot)$$

$$F_{FH} = F_{AB} = 47.19 \text{ kN } (\odot)$$

$$F_{GH} = F_{AC} = 44.64 \text{ kN } (\oplus)$$