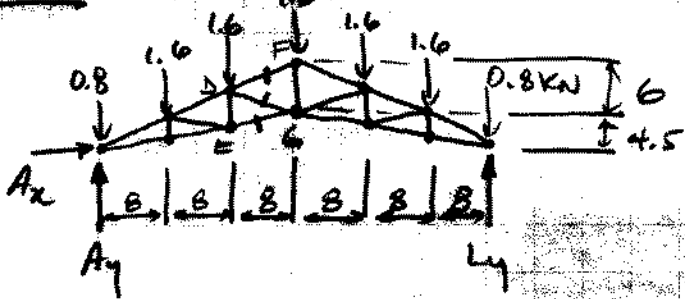


6.49 Déterminez la force dans les éléments DF, DG et EG.



Réactions aux Appuis :

$$\sum F_x = 0 \Rightarrow \boxed{A_x = 0}$$

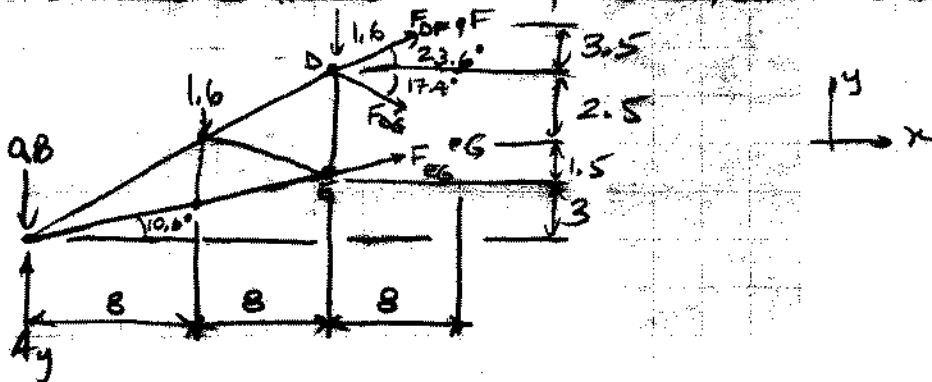
$$\sum F_y = 0 \Rightarrow A_y + L_y - 2(0.8) - 5(1.6) = 0$$

$$\sum M_A = 0 \Rightarrow L_y(48) - 0.8(48) - 1.6(40 + 32 + 24 + 16 + 8) = 0$$

$$\boxed{L_y = 4.8 \text{ kN } \uparrow}$$

$$\text{et } \boxed{A_y = 4.8 \text{ kN } \uparrow}$$

Sectionnez le treillis le long de DF, DG et EG.



$$\oplus \sum M_G = 0 \Rightarrow 1.6(8+16) + 0.8(24) - A_y(24) - F_{DF} \cos 23.6^\circ(25) - F_{DF} \sin 23.6^\circ(8) = 0$$

$$F_{DF} = \frac{-57.6}{\cos 23.6^\circ(25) + \sin 23.6^\circ(8)} = -10.48 \text{ kN} = \underline{\underline{10.48 \text{ kN [C]}}}$$

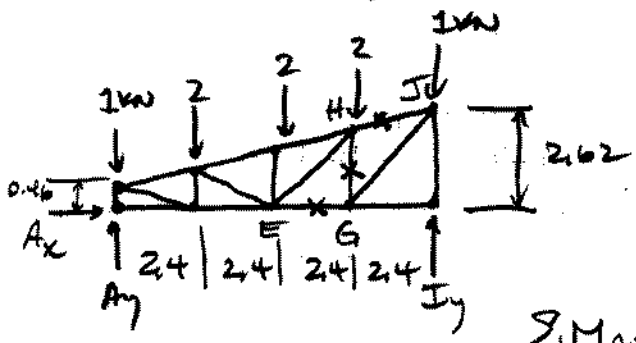
$$\oplus \sum M_A = 0 \Rightarrow -1.6(8+16) - F_{DG} \cos 17.4^\circ(7) - F_{DG} \sin 17.4^\circ(16) = 0$$

$$F_{DG} = \frac{-38.4}{\cos 17.4^\circ(7) + \sin 17.4^\circ(16)} = -3.35 \text{ kN} = \underline{\underline{3.35 \text{ kN [C]}}}$$

$$\pm \sum F_x = 0 \Rightarrow F_{DF} \cos 23.6^\circ + F_{DG} \cos 17.4^\circ + F_{EG} \cos 10.6^\circ = 0$$

$$F_{EG} = \frac{-(-10.48) \cos 23.6^\circ - (-3.35) \cos 17.4^\circ}{\cos 10.6^\circ} = \underline{\underline{13.02 \text{ kN [T]}}}$$

6.52 Calculez l'effort dans les membres EG, GH et HJ.



Reactions aux appuis:

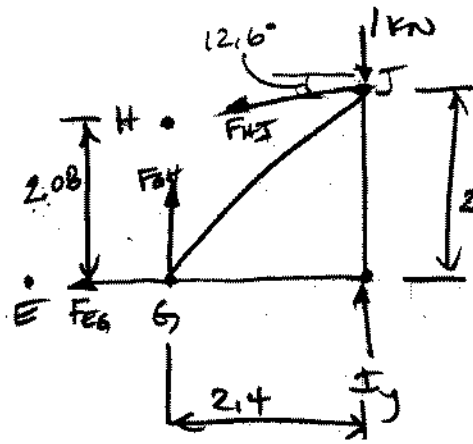
$$\sum F_x = 0 \Rightarrow A_x = 0$$

$$\sum F_y = 0 \Rightarrow A_y + I_y - 2(1) - 3(2) = 0$$

$$\sum M_A = 0 \Rightarrow I_y(4)(2.4) - 1(4)(2.4) - 2(2.4 \times 3 + 2.4 \times 2 + 2.4) = 0$$

$$I_y = 4 \text{ kN} \quad \text{et} \quad A_y = 4 \text{ kN}$$

Sectionnez le treillis le long de EG, HG et HJ.



$$\sum M_H = 0 \Rightarrow -F_{EG}(2.08) - 1(2.4) + I_y(2.4) = 0$$

$$F_{EG} = 3.46 \text{ kN [T]}$$

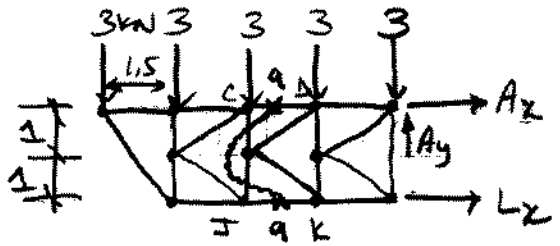
$$\sum M_G = 0 \Rightarrow I_y(2.4) - 1(2.4) + F_{HJ} \cos 12.6^\circ(2.62) - F_{HJ} \sin 12.6^\circ(2.4) = 0$$

$$F_{HJ} = \frac{-7.2}{\cos 12.6^\circ(2.62) - \sin 12.6^\circ(2.4)} = -3.55 \text{ kN} = 3.55 \text{ kN [C]}$$

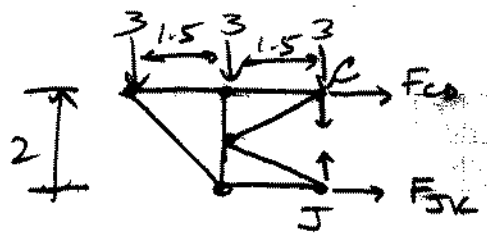
$$\sum M_J = 0 \Rightarrow -F_{EG}(2.62) - F_{GH}(2.4) = 0$$

$$F_{GH} = -(3.46)(2.62) / 2.4 = -3.77 \text{ kN} = 3.77 \text{ kN [C]}$$

6.63 Déterminer la force dans les barres cd et JK.



Utilisons la section à gauche de la ligne ac.



$$\sum M_c = 0 \Rightarrow F_{jk}(2) + 3(1.5 + 3) = 0$$

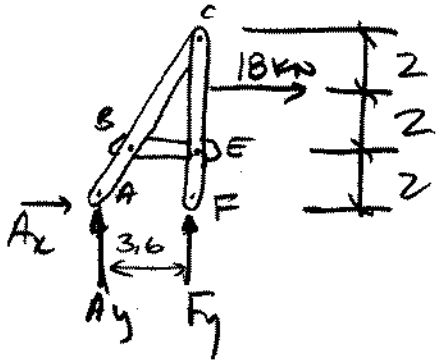
$$F_{jk} = -6.75 \text{ kN}$$

$$= \underline{\underline{6.75 \text{ kN [C]}}}$$

$$\sum F_x = 0 \Rightarrow F_{cd} + F_{jk} = 0$$

$$F_{jk} = -F_{cd} = -(6.75) = \underline{\underline{6.75 \text{ kN [T]}}}$$

6.79 Évaluez les forces sur le membre ABc.



Réactions aux appuis:

$$\sum F_x = 0 \Rightarrow A_x + 18 = 0$$

$$A_x = -18 \text{ kN} = 18 \text{ kN} \leftarrow$$

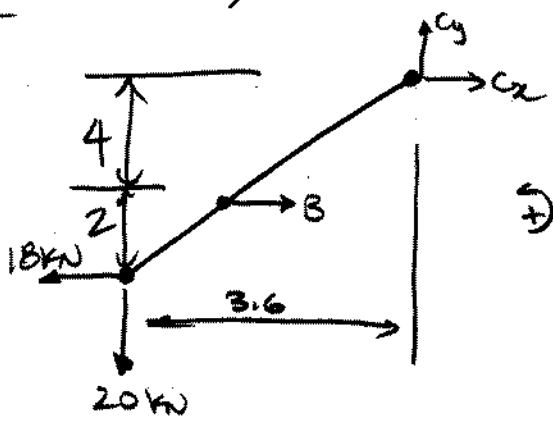
$$\sum M_f = 0 \Rightarrow -A_y(3.6) - 18(4) = 0$$

$$A_y = -20 \text{ kN} \uparrow = 20 \text{ kN} \downarrow$$

$$\sum F_y = 0 \Rightarrow A_y + F_y = 0$$

$$F_y = 20 \text{ kN} \uparrow$$

(6.79 cont) SCI de ABC



* BE est un membre à 2 forces et la force B est dirigée le long de BE

$$\sum M_C = 0 \Rightarrow B(4) + 20(3.6) - 18(6) = 0$$

$$B = 9 \text{ kN} \rightarrow$$

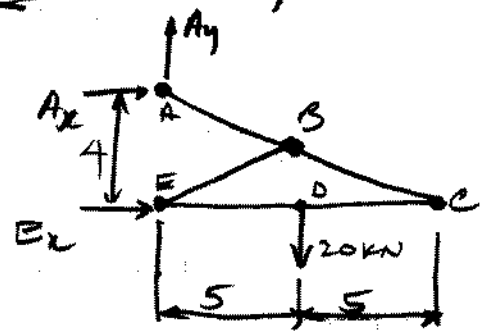
$$\sum F_x = 0 \Rightarrow B + C_x - 18 = 0$$

$$C_x = 9 \text{ kN} \rightarrow$$

$$\sum F_y = 0 \Rightarrow C_y - 20 = 0$$

$$C_y = 20 \text{ kN} \uparrow$$

6.8 Evaluatez les forces sur le membre ABC.



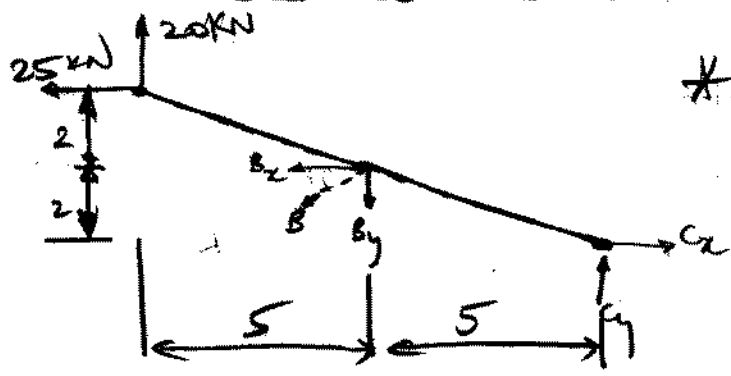
$$\sum M_E = 0 \Rightarrow -A_x(4) - 20(5) = 0$$

$$A_x = -25 \text{ kN} = 25 \text{ kN} \leftarrow$$

$$\sum F_y = 0 \Rightarrow A_y - 20 = 0$$

$$A_y = 20 \text{ kN} \uparrow$$

SCI de ABC



* BE est un membre à 2 forces et la force B est dirigée le long de BE.

$$\frac{B_y}{B_x} = \frac{2}{5} \Rightarrow B_y = \frac{2}{5} B_x$$

(6.8) (cont.)

$$\Rightarrow \sum M_C = 0 \Rightarrow 25(4) - 20(10) + B_x(2) + B_y(5) = 0$$

$$-100 + B_x(2) + \frac{2}{5} B_x(5) = 0$$

$$B_x = \underline{25 \text{ kN} \leftarrow}$$

$$B_y = \underline{10 \text{ kN} \downarrow}$$

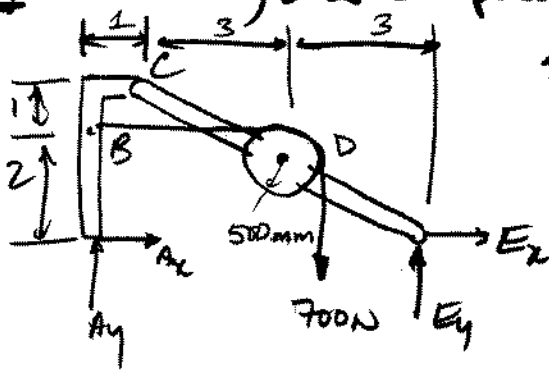
$$\sum F_x = 0 \Rightarrow -25 - 25 + C_x = 0$$

$$C_x = \underline{50 \text{ kN} \rightarrow}$$

$$\sum F_y = 0 \Rightarrow 20 - 10 + C_y = 0$$

$$C_y = \underline{-10 \text{ kN} = 10 \text{ kN} \downarrow}$$

6.9 | Evaluate les composantes des réactions aux points A & E.



$$\Rightarrow \sum M_A = 0 \Rightarrow E_y(7) - 700(4.5) = 0$$

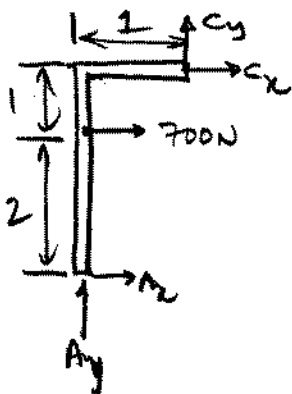
$$E_y = \underline{450 \text{ N} \uparrow}$$

$$\uparrow \sum F_y = 0 \Rightarrow E_y + A_y - 700 = 0$$

$$A_y = \underline{250 \text{ N} \uparrow}$$

$$\Rightarrow \sum F_x = 0 \Rightarrow A_x + E_x = 0 \quad \text{--- (1)}$$

SCI de ABC



$$\Rightarrow \sum M_C = 0 \Rightarrow 700(1) + A_x(3) - A_y(1) = 0$$

$$A_x = \frac{250(1) - 700(1)}{3} = -150 \text{ N}$$

$$= \underline{150 \text{ N} \leftarrow}$$

$$\text{et de (1): } E_x = \underline{150 \text{ N} \rightarrow}$$