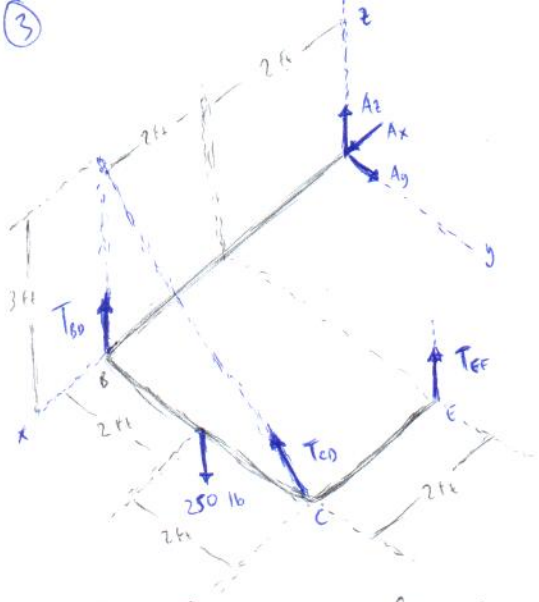
(3)



- Ecs. de equilibrio:

$$\Sigma \vec{F} = \vec{0} \rightarrow \vec{R}_A + \vec{T}_{BD} + \vec{T}_{CD} + \vec{T}_{EF} + \vec{F} = \vec{0}$$

$$\Sigma \vec{M}_A = \vec{0} \rightarrow \vec{M}_A^{T_{BD}} + \vec{M}_A^{T_{CD}} + \vec{M}_A^{T_{EF}} + \vec{M}_A^{F} = \vec{0}$$

- Vectores fuerza

$$\vec{R}_A = (A_x \hat{i} + A_y \hat{j} + A_z \hat{k})\ lb$$

$$\vec{T}_{BD} = (T_{BD} \hat{k})\ lb \quad | \quad \vec{T}_{EF} = (T_{EF} \hat{k})\ lb$$

$$\vec{T}_{CD} = (-0.8 T_{CD} \hat{j} + 0.6 T_{CD} \hat{k})\ lb$$

$$\vec{F} = (-250 \hat{k})\ lb$$

- De la $\Sigma \vec{F} = 0$:

Comp. $\hat{i}$ → $A_x = 0$ ... (i)

Comp. $\hat{j}$ → $A_y - 0.8 T_{CD} = 0$ ... (ii)

Comp. $\hat{k}$ → $A_z + T_{BD} + T_{EF} + 0.6 T_{CD} - 250 = 0$ ... (iii)

- Calculando momentos:

$$\vec{M}_A^{T_{BD}} = \vec{r}_{AB} \times \vec{T}_{BD} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 4 & 0 & 0 \\ 0 & 0 & T_{BD} \end{vmatrix} = (-4 T_{BD} \hat{j})\ lb \cdot ft$$

$$\vec{M}_A^{T_{CD}} = \vec{r}_{AC} \times \vec{T}_{CD} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 4 & 4 & 0 \\ 0 & -0.8 T_{CD} & 0.6 T_{CD} \end{vmatrix} = (2.4 T_{CD} \hat{i} - 2.4 T_{CD} \hat{j} - 3.2 T_{CD} \hat{k})\ lb \cdot ft$$

$$\vec{M}_A^{T_{EF}} = \vec{r}_{AE} \times \vec{T}_{EF} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & 4 & 0 \\ 0 & 0 & T_{EF} \end{vmatrix} = (4 T_{EF} \hat{i} - 2 T_{EF} \hat{j})\ lb \cdot ft$$

$$\vec{M}_A^{F} = \vec{r}_{AG} \times \vec{F} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 4 & 2 & 0 \\ 0 & 0 & -250 \end{vmatrix} = (-500 \hat{i} + 1000 \hat{j})\ lb \cdot ft$$

- De la $\Sigma \vec{M}_A = \vec{0}$:

Comp. $\hat{i}$ → $2.4 T_{CD} + 4 T_{EF} - 500 = 0$ ... (iv)

Comp. $\hat{j}$ → $-4 T_{BD} - 2.4 T_{CD} - 2 T_{EF} + 1000 = 0$ ... (v)

Comp. $\hat{k}$ → $-3.2 T_{CD} = 0$ ... (vi)

- Resolviendo las ecs.

- De (vi) → $T_{CD} = 0$

- De (iv) → $T_{EF} = 125\ lb$

- De (v) → $T_{BD} = 187.5\ lb$

De (i) → $A_x = 0$

De (ii) → $A_y = 0$

De (iii) → $A_z = -62.5\ lb$

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