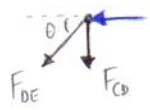
EDP2 - MCR - 3B - 2302

$\theta = \tan^{-1}\left(\frac{8}{6}\right) = 53.13°$

(1) • Analizando el nodo D:



$\pm \rightarrow \sum F_x = 0$; $-F_{DE}\cos\theta - 600 = 0$

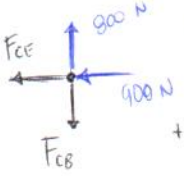
$F_{DE} = \frac{-600}{\cos\theta} = -1000$ N

$+\uparrow \sum F_y = 0$; $-F_{DE}\,\text{sen}\,\theta - F_{CD} = 0$

$F_{CD} = -F_{DE}\,\text{sen}\,\theta = -(-1000)\,\text{sen}\,\theta = 800$ N

$\therefore$ $F_{DE} = 1000$ N (C) | $F_{CD} = 800$ N (T)

• Analizando el nodo C:



$\pm \rightarrow \sum F_x = 0$; $-F_{CE} - 900 = 0$

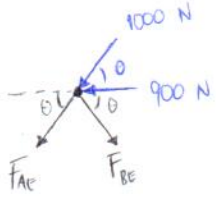
$\therefore$ $F_{CE} = -900$ N

$+\uparrow \sum F_y = 0$; $800 - F_{CB} = 0$

$\therefore$ $F_{CB} = 800$ N

$\therefore$ $F_{CE} = 900$ N (C) | $F_{CB} = 800$ N (T)

• Analizando el nodo E:



$\sum F_x = 0$; $-F_{AE}\cos\theta - 1000\cos\theta + F_{BE}\cos\theta - 900 = 0 \rightarrow -0.6F_{AE} + 0.6F_{BE} - 1500 = 0$ ... (i)

$\sum F_y = 0$; $-F_{AE}\,\text{sen}\,\theta - F_{BE}\,\text{sen}\,\theta - 1000\,\text{sen}\,\theta = 0 \rightarrow -0.8F_{AE} - 0.8F_{BE} - 800 = 0$ ... (ii)

Despejando F_{AE} de (i) y (ii) e igualando: $\frac{0.6F_{BE} - 1500}{0.6} = \frac{-0.8F_{BE} - 800}{0.8}$

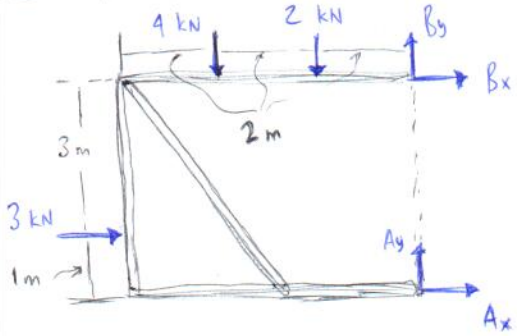
$\rightarrow$ $F_{BE} - 2500 = -F_{BE} - 1000 \rightarrow F_{BE} = 750$ N

$\therefore$ $F_{AE} = F_{BE} - 2500 = 750 - 2500 = -1750$ N

$F_{BE} = 750$ N (T)

$F_{AE} = 1750$ N (C)

(2) - Analizando el bastidor completo:



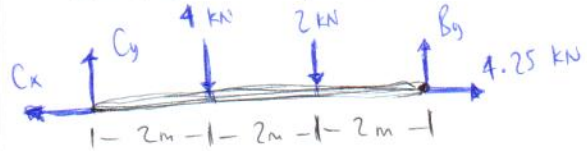
$+\circlearrowleft \sum M_A = 0$; $-3(1) + 4(4) + 2(2) - B_x(4) = 0$

$\therefore$ $B_x = \frac{-3(1) + 4(4) + 2(2)}{4} = 4.25$ kN

$\pm \rightarrow \sum F_x = 0$; $3 + B_x + A_x = 0 \rightarrow A_x = -3 - B_x = -7.25$ kN

$+\uparrow \sum F_y = 0$; $A_y + B_y - 4 - 2 = 0 \rightarrow A_y + B_y = 6$ ... (i)

- Analizando el componente BC:



$+\circlearrowleft \sum M_C = 0$; $-4(2) - 2(4) + B_y(6) = 0$

$\therefore$ $B_y = \frac{8 + 8}{6} = 2.667$ kN

De (i) $\rightarrow$ $A_y = 6 - B_y = 3.333$ kN

$\therefore$ Reacciones de los pasadores en A y B:

$A_x = 7.25$ kN ←

$A_y = 3.333$ kN ↑

$B_x = 4.25$ kN →

$B_y = 2.667$ kN ↑