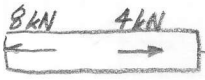
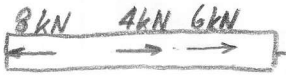
(4-5)

N_{AB}: 

$\Sigma F_x = 0,\ -8\,kN + N_{AB} = 0$
$N_{AB} = 8\,kN$

N_{BC}: 

$\Sigma F_x = 0,\ -8\,kN + 4\,kN + N_{BC} = 0$
$N_{BC} = 4\,kN$

N_{CD}: 

$\Sigma F_x = 0,\ -8\,kN + 4\,kN + 6\,kN + N_{CD} = 0$
$N_{CD} = -2\,kN$

N_{DE}: 

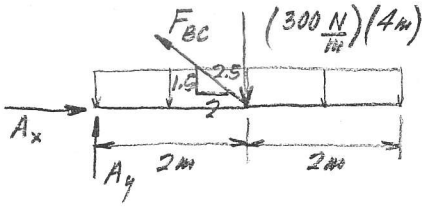
$\Sigma F_x = 0,\ -8\,kN + 4\,kN + 6\,kN - 2\,kN + N_{DE} = 0$
$N_{DE} = 0$

$$\delta_{A/E} = \sum \frac{PL}{AE}, \text{ since } AE \text{ constant} = \frac{1}{AE}\sum PL$$

$$\delta_{A/E} = \frac{1}{\frac{\pi}{4}(0.030\,m)^2\left(73.1\times10^6\,\frac{kN}{m^2}\right)}\Big((8\,kN)(4\,m) + (4\,kN)(2\,m) + (-2\,kN)(2\,m)\Big)$$

$$= 6.967\times10^{-4}\,m \text{ or } \boxed{0.697\,mm}$$

(4-13)

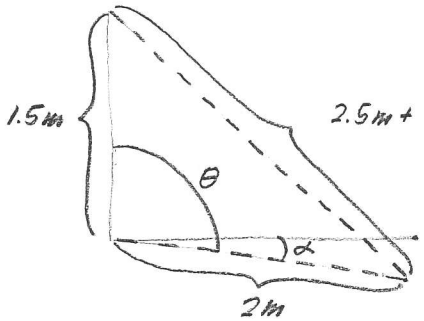


$\left(300\,\frac{N}{m}\right)(4\,m) = 1{,}200\,N$

$$\Sigma M_A = 0,\ \left(\frac{1.5}{2.5}F_{BC}\right)(2\,m) - (1{,}200\,N)(2\,m) = 0$$

$$F_{BC} = 2{,}000\,N$$

rod CB: $\delta_{CB} = \dfrac{(2.000\,kN)(2.5\,m)}{(14\,mm^2)\left(\frac{1\,m}{1{,}000\,mm}\right)^2\left(68.9\times10^6\,\frac{kN}{m^2}\right)} = 0.005183\,m$

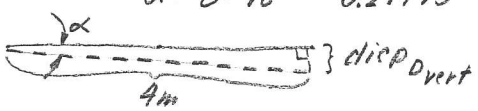


$2.5\,m + 0.005183\,m = 2.505183\,m$

law of cosines: $(2.505183\,m)^2 = (2m)^2 + (1.5m)^2 - 2(2m)(1.5m)\cos\theta$

$\theta = 90.24773°$

$\alpha = \theta - 90° = 0.24773°$



$4\,m\sin(0.24773°) = disp_{D_{vert}}$

$disp_{D_{vert}} = 0.01729\,m \rightarrow \boxed{17.3\,mm}$

(4-26) C:

$\Sigma F_y = 0, \quad -F_{AC}\sin 60° + F_{BC}\sin 60° = 0$

$F_{AC} = F_{BC}$

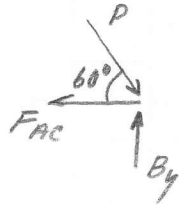
$\Sigma F_x = 0, \quad -F_{AC}\cos 60° - F_{BC}\cos 60° + P = 0$

$2F_{BC}\cos 60° = P$

$F_{BC} = P \ (C)$

$F_{AC} = P \ (T)$

B:



$\Sigma F_x = 0, \quad -F_{AC} + P\cos 60° = 0$

$F_{AC} = 0.5P \ (T)$

$\delta_{B/A} = \frac{PL}{AE} = 0.03 \text{ in}$

(A is fixed due to pin support)

$$0.03 \text{ in} = \frac{(0.5P)(16 \text{ ft})\left(\frac{12 \text{ in}}{1 \text{ ft}}\right)}{(0.75 \text{ in}^2)\left(29{,}000 \frac{\text{kip}}{\text{in}^2}\right)}$$

$P = 6.797 \text{ kip} \rightarrow \boxed{6.80 \text{ kip}}$