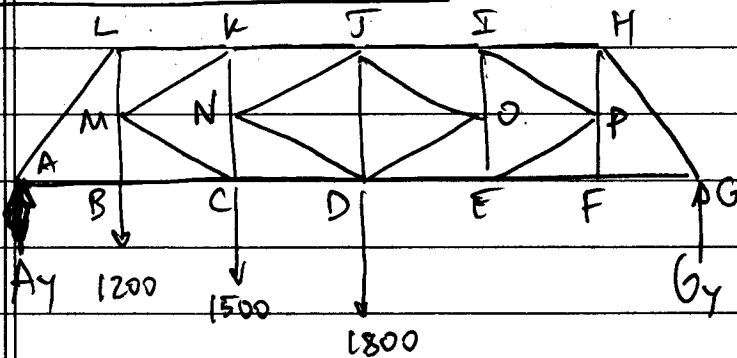


K-Truss Problem

10/26/04 ECL

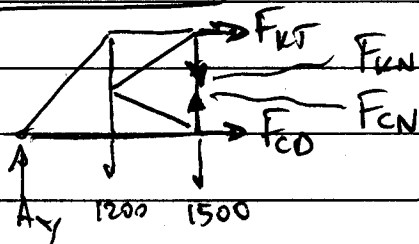


Consider Equilibrium of the following pieces of this truss.

① Entire Truss: $\uparrow \sum M_G = 0 \Rightarrow -A_y(120) + 1200(100) + 1500(80) + 1800(60) = 0$

$A_y = 2900 \text{ lb}$

② Left Section: $\rightarrow \sum F_x = F_{KN} + F_{CO} = 0$

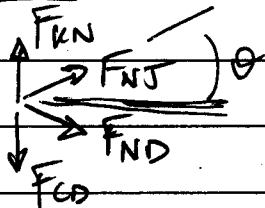


$\uparrow \sum F_y = A_y + F_{CN} - F_{KN} - 1200 - 1500 = 0$

$F_{CN} - F_{KN} = 2700 - A_y$

$F_{CN} - F_{KN} = -200 \text{ lb}$

③ Joint N: $\rightarrow \sum F_x = F_{NJ} \cos \theta + F_{ND} \cos \theta = 0$



$F_{NJ} = -F_{ND}$

$\uparrow \sum F_y = F_{KN} - F_{CO} - F_{ND} \sin \theta + F_{NJ} \sin \theta$

$= F_{KN} - F_{CO} - 2F_{ND} \sin \theta = 0$

$F_{KN} - F_{CO} = 2F_{ND} \sin \theta$

So, $2F_{ND} \sin \theta = +200 \text{ lb}$

$F_{ND} = 100 / \sin \theta$ So $F_{ND} \neq 0$

And $F_{CN} - F_{KN} = -200 \text{ lb}$ & $F_{CN} \neq F_{KN}$