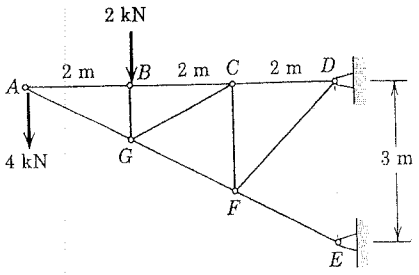
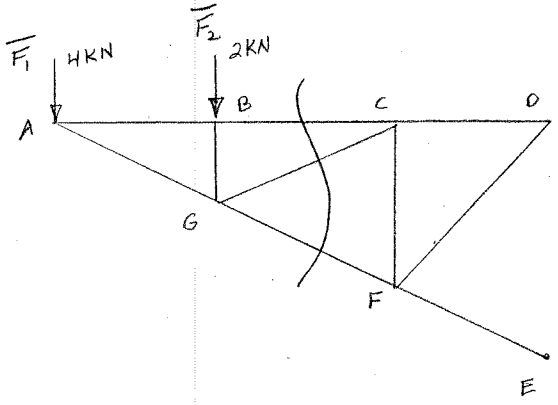
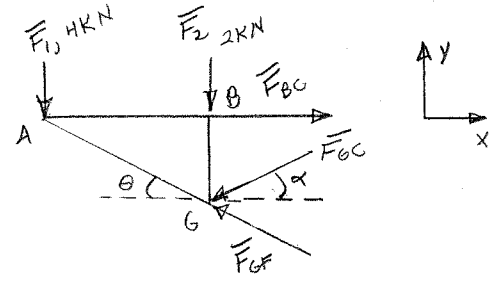
11A. Determine the forces in members BC, CG and GF using the Method of Sections for the truss shown below.







$\tan\theta = \frac{1m}{2m} \Rightarrow \theta = 26.6°$

$\tan\alpha = \frac{1m}{2m} \Rightarrow \alpha = 26.6°$

$\Sigma \bar{F}_x = 0 = (F_{BC} - F_{GC}\cos 26.6 - F_{GF}\cos 26.6)\bar{i}$

$\Sigma \bar{F}_y = 0 = (-4KN - 2KN - F_{GC}\sin 26.6 + F_{GF}\sin 26.6)$

$\Sigma \bar{M}_G = 0 = (4KN(2m) - F_{BC}(1m))\bar{k}$

$F_{BC} = 8KN\ (T)$

$\Sigma \bar{M}_A = 0 = (-2KN(2m) - F_{GC}\sin 26.6(2m)$

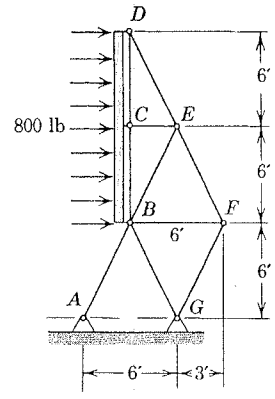
$- F_{GC}\cos 26.6(1m))\bar{k}$

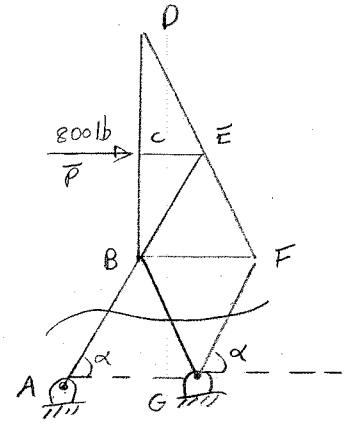
$= -4KNm - 1.790F_{GC} = 0$

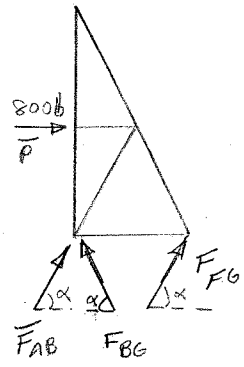
$F_{GC} = -2.23KN$ (wrong direction) (T)

$F_{GF} = 11.2KN\ (C)$

11B. An outdoor sign is supported by the truss shown below. To evaluate the wind loading associated with a Category I hurricane, the sign will be assumed to be loaded by a pressure distribution that produces a resultant horizontal force of 800 lb acting only on point C. Determine the forces in members AB, BG and GF using the Method of Sections.







$\tan\alpha = \frac{6}{3} \Rightarrow \alpha = 63.4^\circ$

$\Sigma \bar{M}_B = 0 = \{(-800)(6) + F_{FG}\sin\alpha(6)\}\bar{k}$

$\Sigma M_B = \{-4800 + 5.36 F_{FG}\} = 0$

$5.36 F_{FG} = 4800$

$F_{FG} = 895\,lb\,(C)$

$\Sigma \bar{M}_G = 0 = \{-(800)(12) - F_{AB}\cos\alpha(6) - F_{AB}\sin\alpha(3)\}\bar{k}$

$0 = \{-9600 - 2.69 F_{AB} - 2.68 F_{AB}\}\bar{k}$

$\Sigma \bar{F}_y = 0 = \{F_{AB}\sin\alpha + F_{BG}\sin\alpha + F_{FG}\sin\alpha\}\bar{j}$

$0 = -9600 - 5.37 F_{AB} = 0$

$0 = .894\{F_{AB} + F_{BG} + F_{FG}\}$ ⟸

$F_{AB} = -1787\,lb$ (wrong direction) (T)

$\therefore F_{AB} + F_{BG} + F_{FG} = 0$

$-1787 + F_{BG} + 895 = 0$

$\therefore F_{BG} = 892\,lb\,(C)$