FBD of Frame

\[ \sum F_x = 0; \quad A_x = 0 \]

\[ \sum M_A = 0; \quad -4(5) - 4(10) - 5(10) - 3(20) + E_y(20) = 0 \]

\[ \Rightarrow E_y = 9.75 \text{ kN} \]

\[ \sum F_y = 0; \quad A_y - 18 + E_y = 0 \]

\[ A_y = 8.25 \text{ kN} \]

\[ \theta_1 = \tan^{-1}\left(\frac{3}{5}\right) = 30.96^\circ \]

\[ \theta_2 = \tan^{-1}\left(\frac{3}{8}\right) = 21.8^\circ \]

\[ \Rightarrow \sum F_x = 0; \quad -F_G \cos(21.8) - F_{cd} - F_{cf} \cos(30.96) = 0 \]

\[ 4) \sum M_F = 0; \quad 3F_{cd} - 5(3) + 5(9.75) = 0 \]

\[ F_{cd} = -11.25 \text{ kN (c)} \]

\[ \sum F_y = 0; \quad 9.75 - 5 - 3 + F_{cf} \sin(21.8) - F_{G} \sin(21.8) = 0 \]

\[ \Rightarrow F_{F_G} = 9.15 \text{ kN (T)} \]

\[ F_{cf} = 3.21 \text{ kN (T)} \]

FBD of cut (1)

\[ \sum F_x = 0; \quad F_G = F_{CH} \quad \text{By Symmetry} \]

\[ \sum F_y = 0; \quad F_{ca} + 2F_{cf} \sin(21.8) = 0 \]

\[ F_{ca} = -6.80 \text{ kN (c)} \]

Tips for Sections

1) FBD of Frame
   - find support reactions

2) Make cuts thru 3 members or less
   - Start outside truss and end outside

3) Draw member forces as tension
   - Forces point out of member