

1-6

From an overall free-body diagram, the equations of equilibrium

$$\rightarrow \Sigma F_x = 0: \quad A_x = 0$$

$$\uparrow \Sigma F_y = 0: \quad A_y - 10 - 15 + N_F = 0$$

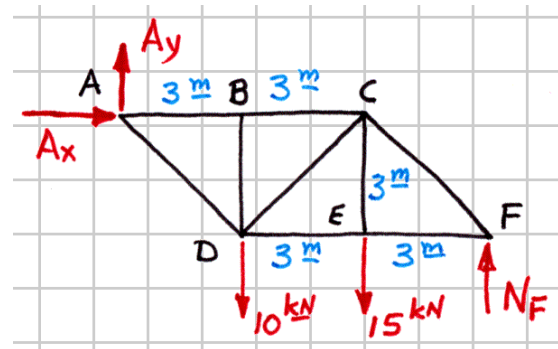
$$\circlearrowleft \Sigma M_A = 0: \quad 9N_F - 3(10) - 6(15) = 0$$

are solved to get

$$A_x = 0 \text{ kN}$$

$$A_y = 11.6667 \text{ kN } \uparrow$$

$$N_F = 13.3333 \text{ kN } \uparrow$$



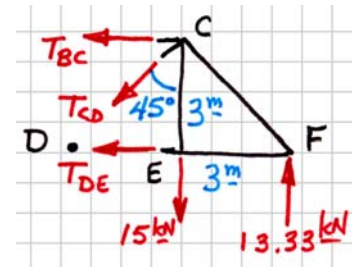
Then, from a free-body diagram of the right hand section of the truss, the equations of equilibrium

$$\circlearrowleft \Sigma M_C = 0: \quad 3(13.3333) - 3T_{DE} = 0$$

$$\circlearrowleft \Sigma M_D = 0: \quad 3T_{BC} - 3(15) + 6(13.3333) = 0$$

$$\uparrow \Sigma F_y = 0: \quad 13.3333 - 15 - T_{CD} \cos 45^\circ = 0$$

are solved to get



$$T_{DE} = 13.33 \text{ kN (T)} \dots\dots\dots \text{Ans.}$$

$$T_{BC} = -11.67 \text{ kN} = 11.67 \text{ kN (C)} \dots\dots\dots \text{Ans.}$$

$$T_{CD} = -2.36 \text{ kN} = 2.36 \text{ kN (C)} \dots\dots\dots \text{Ans.}$$