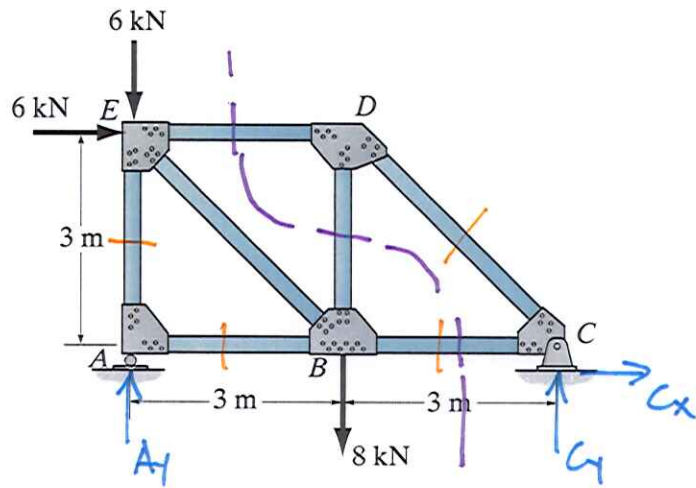


Problem 3-18: Determine the forces in all bars of the truss



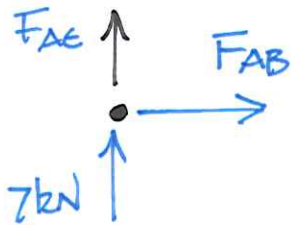
$$\sum M_k = 0 = 8 \text{ kN}(3 \text{ m}) - 6 \text{ kN}(3 \text{ m}) + 6 \text{ kN}(6 \text{ m}) - A_y(6 \text{ m})$$

$$\underline{A_y = 7 \text{ kN}}$$

$$\sum F_y = 0 = A_y + C_y - 8 \text{ kN} - 6 \text{ kN} \quad \underline{C_y = 7 \text{ kN}}$$

$$\sum F_x = 0 = C_x + 6 \text{ kN} \quad \underline{C_x = -6 \text{ kN}}$$

JOINT A

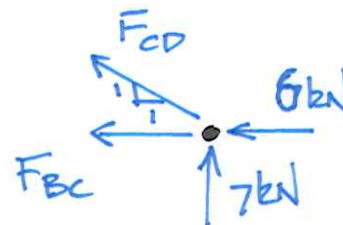


$$\sum F_y = 0 = F_{AE} + 7 \text{ kN}$$

$$\underline{F_{AE} = -7 \text{ kN}}$$

$$\sum F_x = 0 = F_{AB}$$

JOINT C



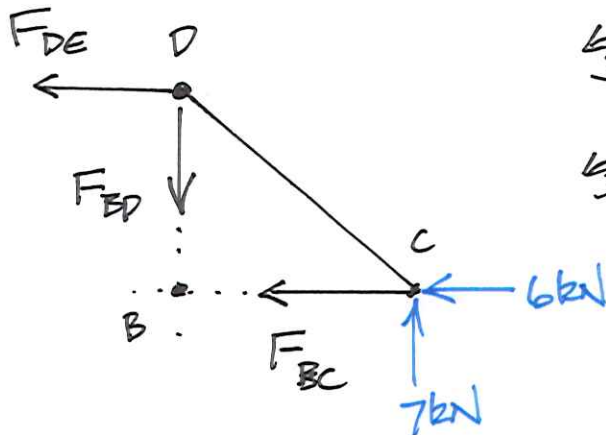
$$\sum F_y = 0 = \frac{1}{\sqrt{2}} F_{CD} + 7 \text{ kN}$$

$$\underline{F_{CD} = -9.8 \text{ kN}}$$

$$\sum F_x = 0 = -F_{BC} - \frac{1}{\sqrt{2}} F_{CD} - 6 \text{ kN}$$

$$\underline{F_{BC} = 1 \text{ kN}}$$

METHOD OF SECTIONS



$$\sum M_D = 0 = -F_{BC}(3 \text{ m}) + 7 \text{ kN}(3 \text{ m}) - 6 \text{ kN}(3 \text{ m}) \quad \underline{F_{BC} = 1 \text{ kN}} \checkmark$$

$$\sum M_B = 0 = F_{DE}(3 \text{ m}) + 7 \text{ kN}(3 \text{ m}) \quad \underline{F_{DE} = -7 \text{ kN}} \checkmark$$

$$\sum F_y = 0 = -F_{BD} + 7 \text{ kN}$$

$$\underline{F_{BD} = 7 \text{ kN}} \checkmark$$