

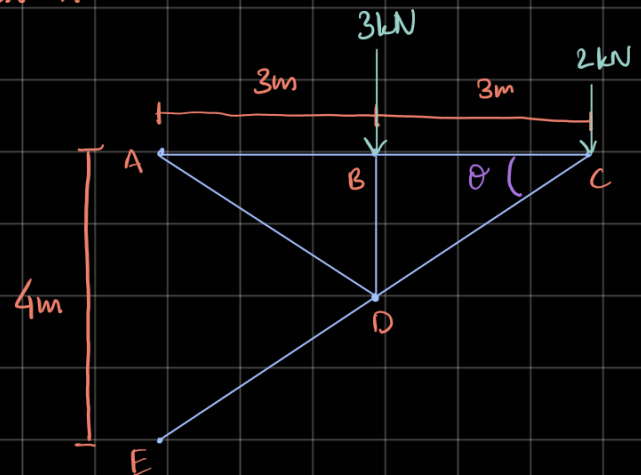
Truss

All members are connected by pin joints

No bending moment

Only axial forces \rightarrow Tension & Compression

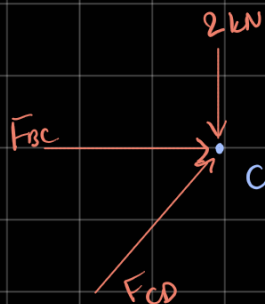
Triangular frames



3. Method of Joints

Joint C

$$\theta = \tan^{-1}\left(\frac{4}{6}\right)$$
$$= 33.69^\circ$$



$$\sum F_y = 0$$

$$-2 + F_{CD} \sin \theta = 0$$

$$F_{CD} = \frac{2}{\sin \theta}$$

$$= 3.6 \text{ kN}$$

$$\sum F_x = 0$$

$$F_{BC} + F_{CD} \cos \theta = 0$$

$$F_{BC} = -3.6 \cos 33.69$$

$$= \underline{\underline{-3 \text{ kN}}}$$

Joint B

$$\sum F_y = 0$$

$$-3 + F_{BD} = 0$$



$$F_{DB} = \underline{3 \text{ kN}}$$

$$\sum F_x = 0$$

$$F_{AB} - (-3) = 0$$

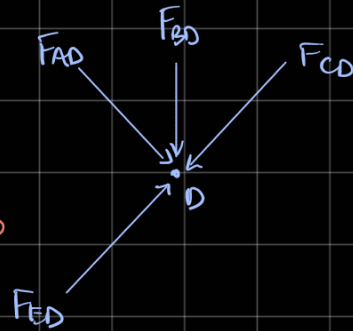
$$F_{AB} = -3 \text{ kN}$$

Joint D

$$\sum F_y = 0$$

$$F_{ED} \sin \theta - F_{AD} \sin \theta - F_{BD} - F_{CD} \sin \theta = 0$$

$$\begin{aligned} F_{ED} - F_{AD} &= F_{BD} \operatorname{cosec} \theta + F_{CD} \\ &= 3 \operatorname{cosec} (33.69) + 3.6 \text{ kN} \\ &= \underline{9.01 \text{ kN}} \end{aligned}$$



$$\sum F_x = 0$$

$$F_{ED} \cos \theta + F_{AD} \cos \theta - F_{CD} \cos \theta = 0$$

$$F_{ED} + F_{AD} = 3.6 \text{ kN}$$

$$F_{ED} = F_{AD} + 9.01$$

$$(-) F_{ED} = -F_{AD} + 3.6$$

$$0 = 2F_{AD} + 5.41$$

$$F_{AD} = \underline{-2.705 \text{ kN}}$$

$$F_{ED} = -2.705 + 9.01$$

$$= \underline{6.31 \text{ kN}}$$