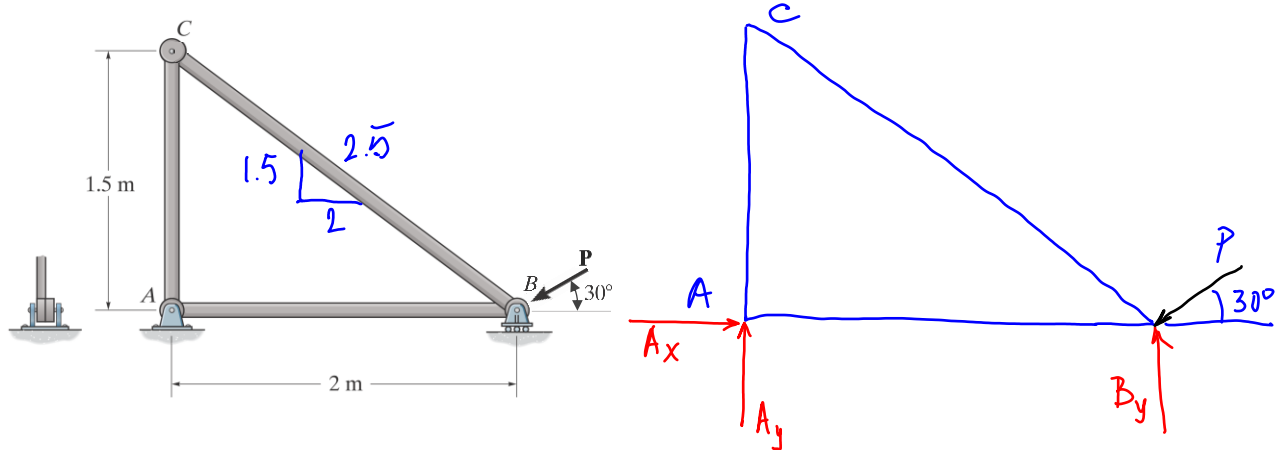


Truss Analysis using the Method of Joints

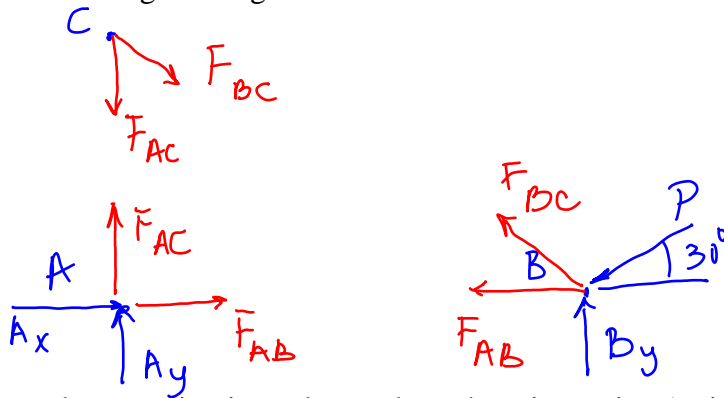
This method isolates every joint of the truss.

Step 1: Treat the entire truss as a **single structure** to get the support reactions.



$$\begin{aligned} \sum M_A = 0 &\rightarrow B_y & \sum F_x = 0 &\Rightarrow A_x \\ \sum M_B = 0 &\rightarrow A_y \end{aligned}$$

Step 2 Draw a FBD for all of the **individual joints**. The internal forces of the members are directed along the length of each member.



A good convention is to always draw them in tension (or in compression if you prefer) to be consistent along the truss and avoid errors.

If we find a negative magnitude of these internal forces, then we know that that truss member is in compression. Then we will change the direction and correct ourselves.

For each node we can write two equations: sum of forces on x-direction and sum of forces on y-direction.

$$\begin{aligned} @B \quad \sum F_y = 0 &\Rightarrow F_{BC} & \& \quad \sum F_x = 0 &\Rightarrow F_{AB} \\ @A \quad \sum F_x = 0 &\Rightarrow F_{AB} & \& \quad \sum F_y = 0 &\Rightarrow F_{AC} \end{aligned}$$