ENSC 2113
Engineering Mechanics: Statics

Lecture 21 (pt. 2)
Sections 6.1-6.4

College of Engineering, Architecture & Technology

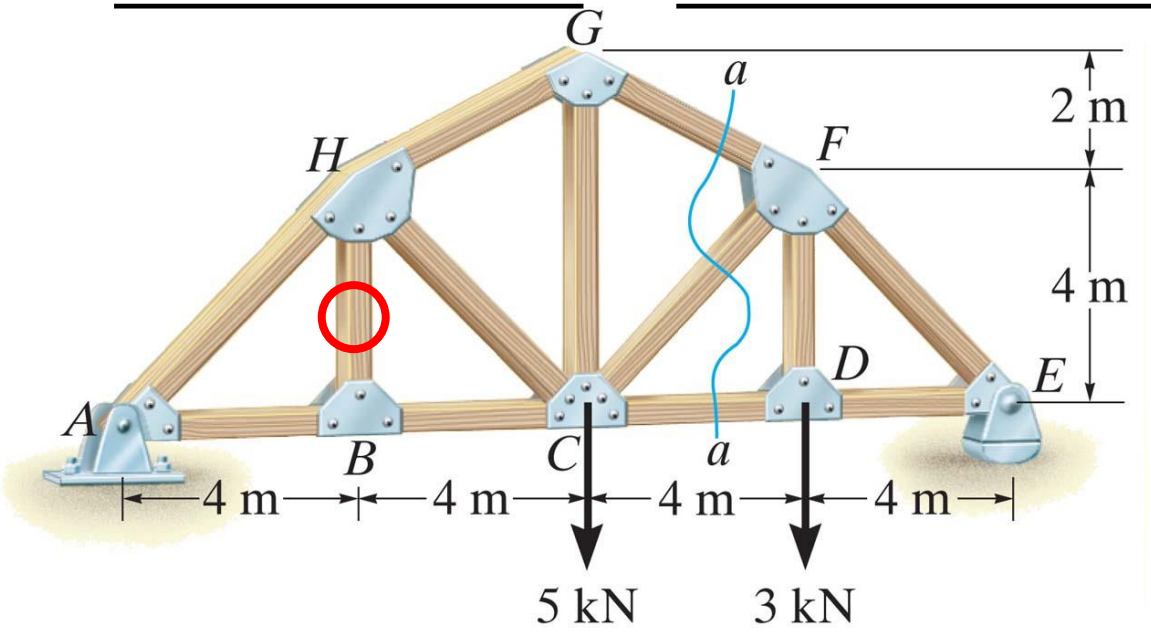
Two-Dimensional Truss Analysis:

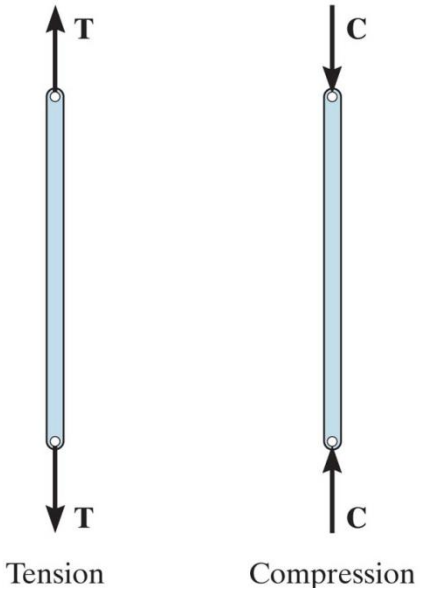
Simple trusses have the following assumptions:

1. All members are two-force members.
2. All joints are pin connected (thus, no moment).
3. All loads applied at the joints.
4. Weight of truss members is negligible.

Determine *Zero-Force Members* first to simplify process

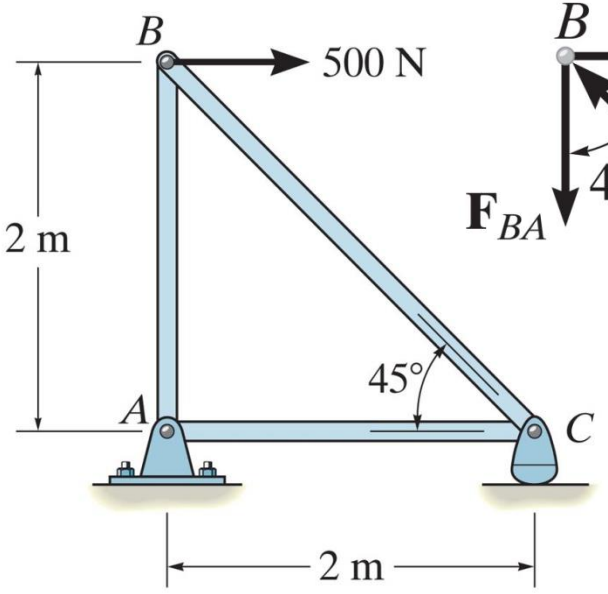
Use *Method of Joints* or *Method of Sections* to solve

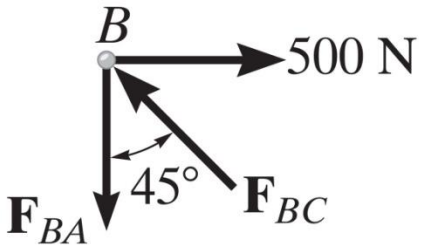


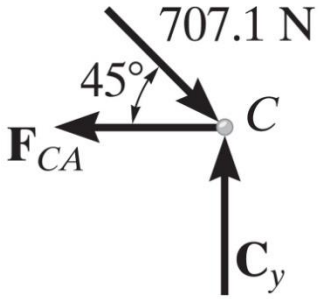


Procedure for analysis using ***Method of Joints***:

1. Draw **FBD** of the entire truss and solve for reactions.
2. Draw **FBD** of joint with no more than 2 unknown forces.
3. Apply equilibrium eqns to solve for unknown member forces, & determine if member is in tens. or compr.
4. Go to another joint w/ no more than 2 unknown forces.
5. Repeat steps 4 & 5 until all members forces are found.
6. You also need to identify all ***Zero-Force Members*** ...





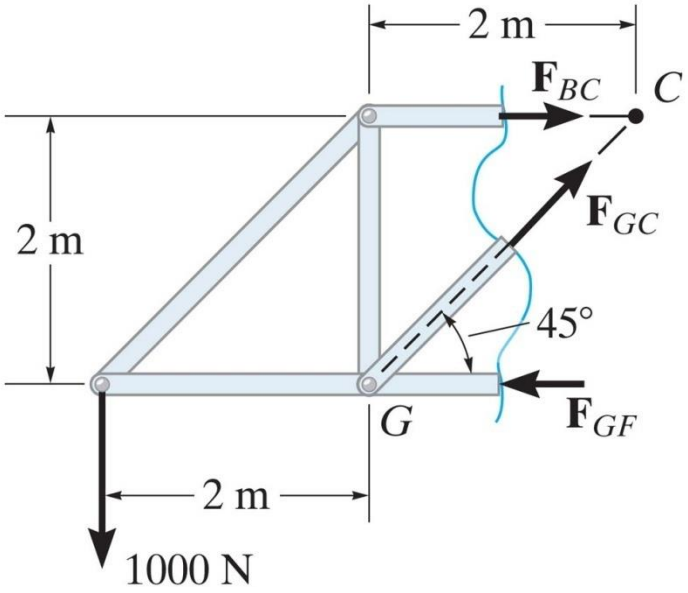


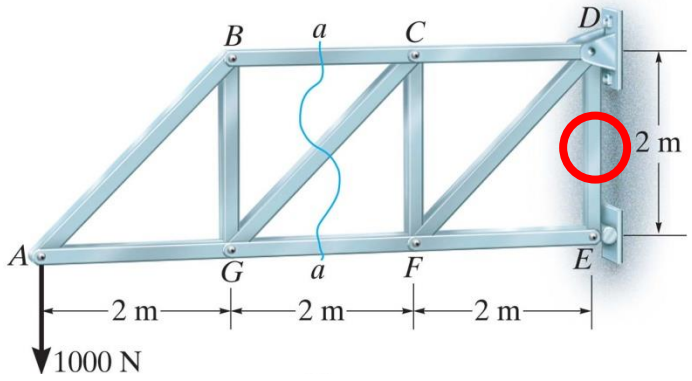
$$\rightarrow \sum F_x = 0$$

$$\uparrow \sum F_y = 0$$

Procedure for analysis using ***Method of Sections***:

1. Draw **FBD** of truss & solve for support reactions.
2. Cut the truss through members where forces are to be determined – This may require multiple cuts.
3. Assume sense of direction of unknown forces, and apply equilibrium eqns to solve for member forces.





NOTE: Find zero-force mbrs to simplify process.

$$\rightarrow \sum F_x = 0 \quad \uparrow \sum F_y = 0 \quad \sum M = 0$$

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