FAQ's

1. Discuss the analysis of truss by method of joints?

- Each joint in a truss is consider as a separate freebody in equilibrium
- Unknown forces are determined using equations of equilibrium namely ∑v =0 and ∑h=0
- Joints considered as free body should be such that it should not have more than 2 unknown forces

2. What is cantilever truss?

If anyone of the member of the truss is fixed and the other end is free, and the other end is free, it is called a cantilever truss. There is no reaction force at the fixed end.

3. What are the hints to be followed while analyzing a cantilever truss using method of joints?

- There is no need to find the support reactions.
- All the members are assumed to be tensile.
- Consider tensile forces as positive and compressive as negative.
- The force convention is, upward force assigns positive sign and downward force assigns negative sign.
- The analysis is to be started from the free end where there is maximum of two unknown forces, using the condition of ∑v =0 and ∑h=0.

4. The cantilever truss in the given Fig is hinged at D and E. Find the force in each member

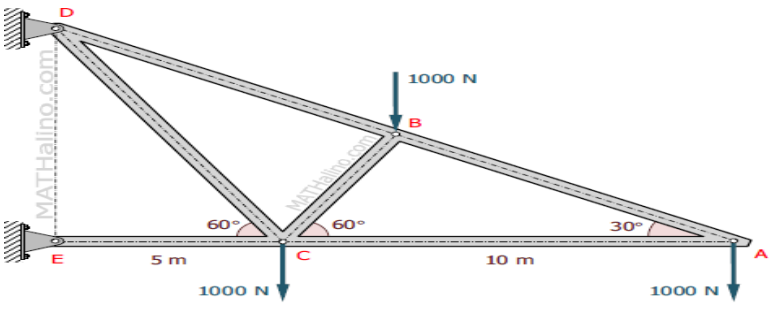
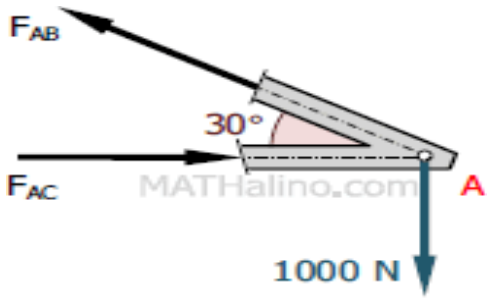


Figure P-406

At Joint A

$\Sigma F_V = 0$ ΣFV=0



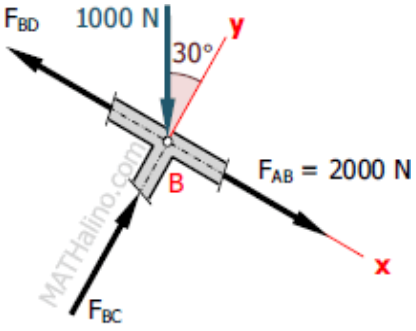
FBD of Joint A

$F\,AB \sin 30^\circ = 1000$
$F\,AB = 2000\text{N}$ FAB=2000N tension
$\Sigma F\,H = 0$ ΣFH=0

$F\,AC = F\,AB \cos 30^\circ$ FAC=FABcos30°

$F\,AC = 2000\cos 30^\circ$ FAC=2000cos30°

$F\,AC = 1732.05\text{N}$ FAC=1732.05N compression



FBD of Joint B

At Joint B
$\Sigma F\,y = 0$ ΣFy=0

$F\,BC = 1000\cos 30^\circ$ FBC=1000cos30°

$F\,BC = 866.02\text{N}$ FBC=866.02N compression

$\Sigma F\,x = 0$ ΣFx=0

$F\,BD = 1000\sin 30^\circ + 2000$ FBD=1000sin30°+2000

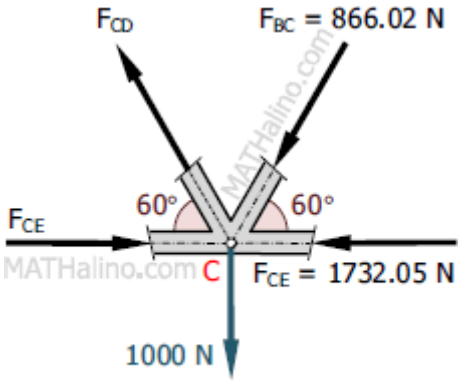
F_{BD} =2500N FBD=2500N tension

At Joint C

$\Sigma F_V = 0$ ΣFV=0

$F_{CD}\sin 60^\circ = 866.02\sin 60^\circ + 1000$ FCDsin60°=866.02sin60°+1000

F_{CD} =2020.72N FCD=2020.72N tension



FBD of Joint C

$\Sigma F_H = 0$ ΣFH=0

$F_{CE} = F_{CD}\cos 60^\circ + 866.02\cos 60^\circ + 1732.05$ FCE=FCDcos60°+866.02cos60°+1732.05

$F_{CE} = 2020.72\cos 60^\circ + 866.02\cos 60^\circ + 1732.05$ FCE=2020.72cos60°+866.02cos60°+1732.05

F_{CE} =3175.42N FCE=3175.42N compression

Result :

AB = 2000 N tension
AC = 1732.05 N compression
BC = 866.02 N compression
BD = 2500 N tension
CD = 2020.72 N tension
CE = 3175.42 N compression