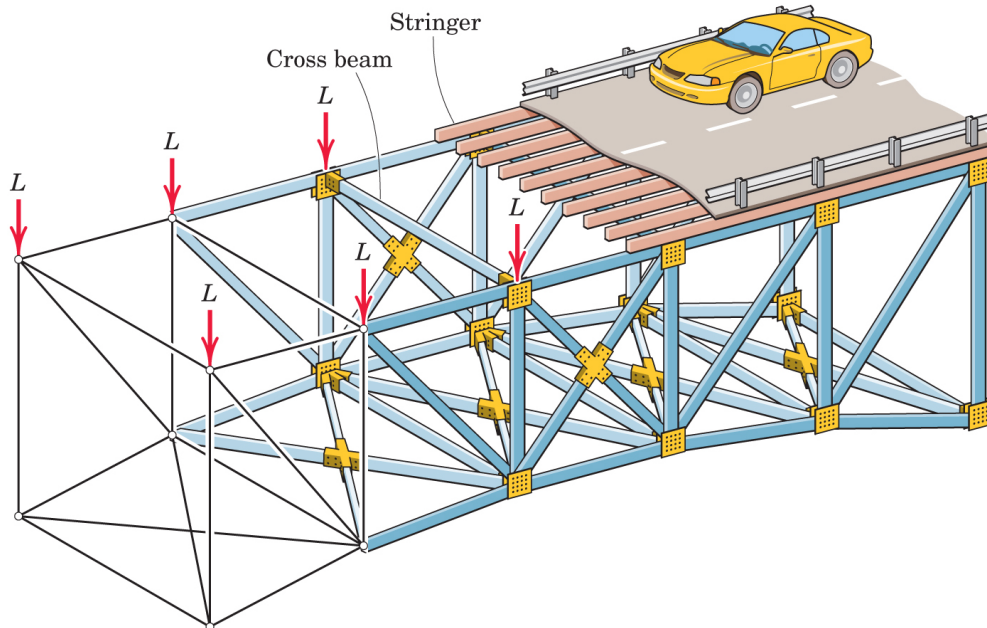


# ENGG 202

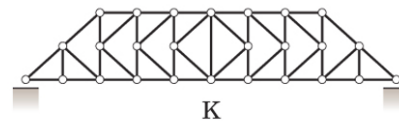
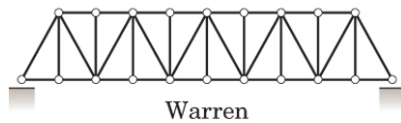
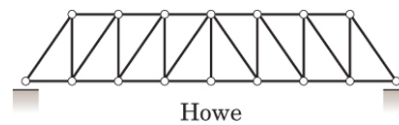
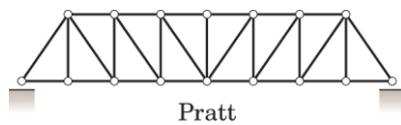
## Feb 27 Week 7

### Problems

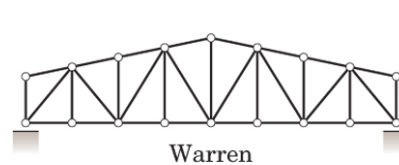
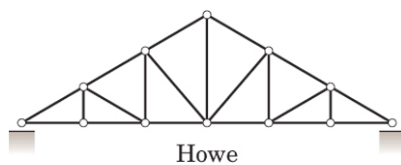
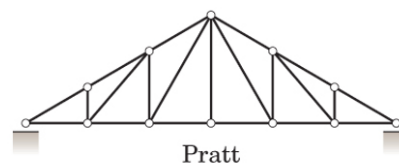
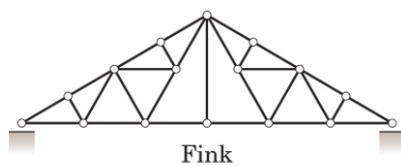
## 4/2 PLANE TRUSSES



Examples of commonly used trusses:

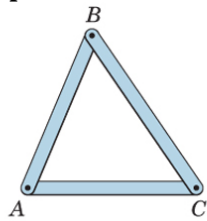


Commonly Used Bridge Trusses

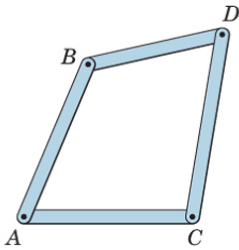


Commonly Used Roof Trusses

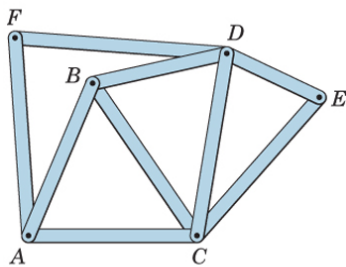
## Simple trusses



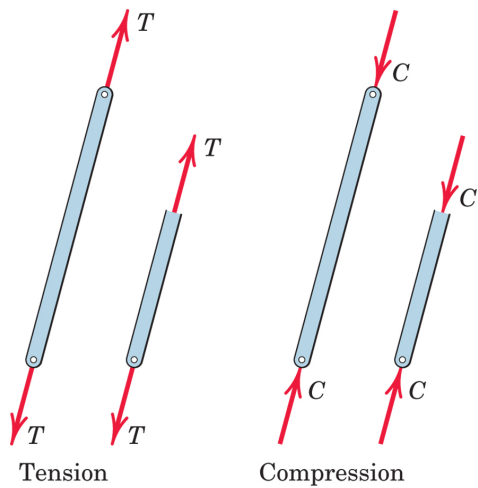
(a)



(b)

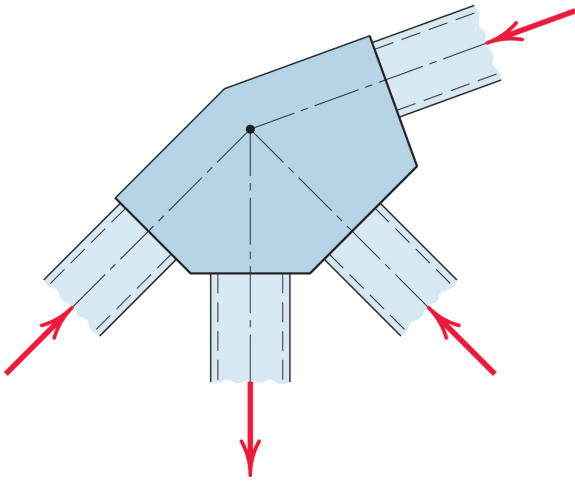


(c)



Two-Force Members

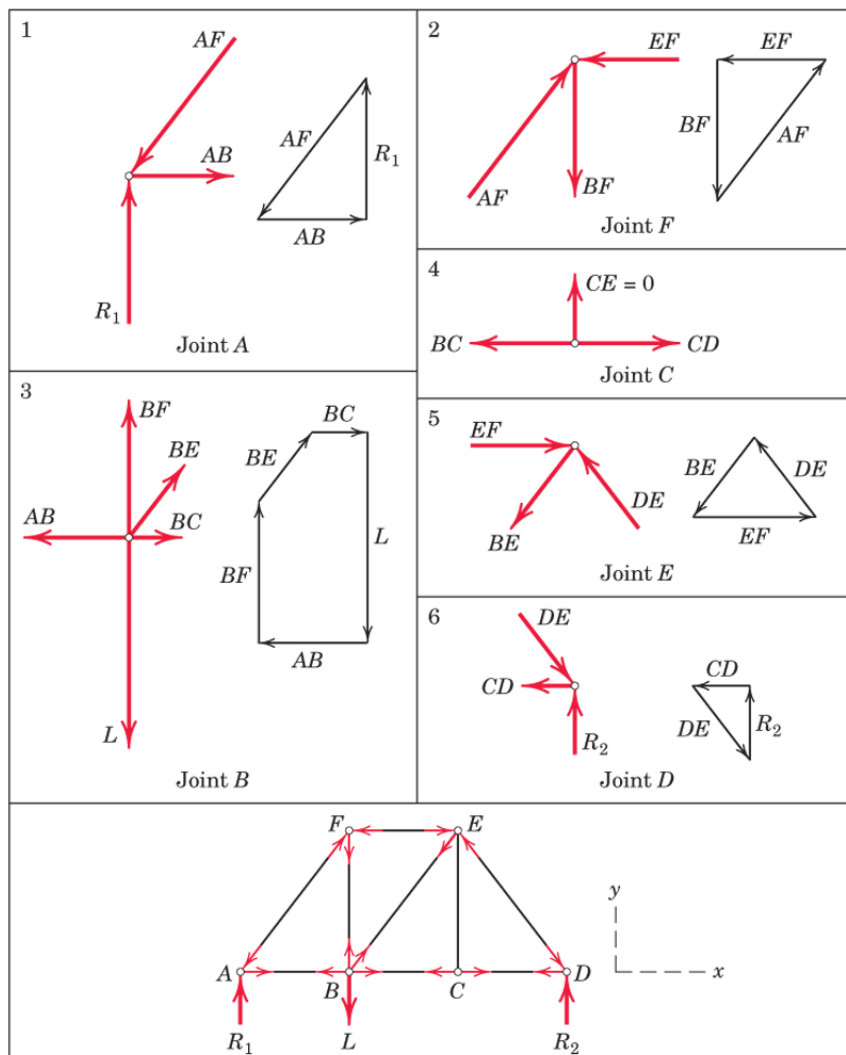
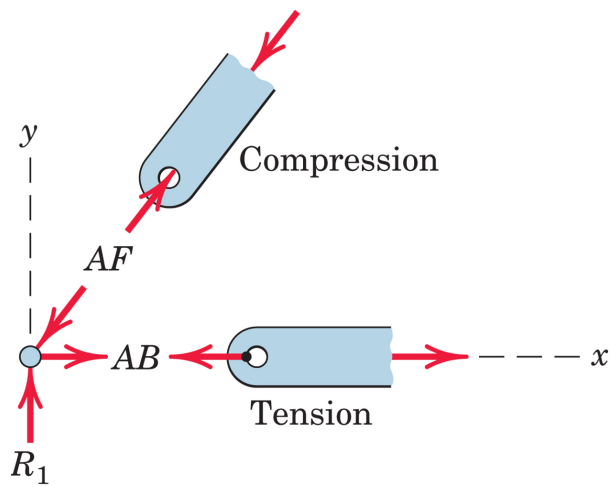
## Truss connection and support



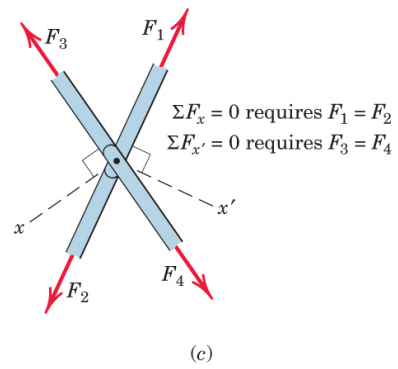
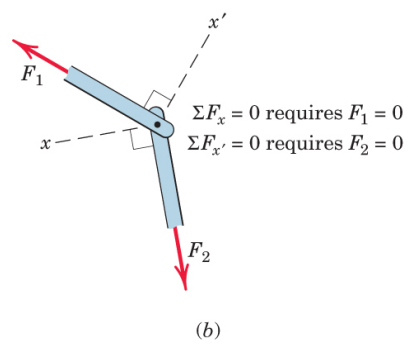
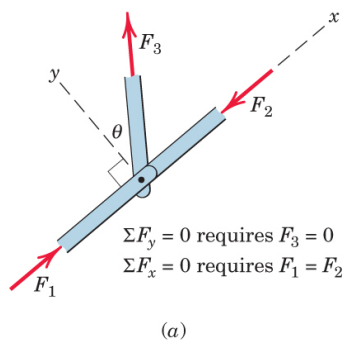
In the analysis of trusses we make some assumptions:

- The members of a truss are slender, and cannot support any lateral loads
- Loads on trusses are applied only at the joints  
(i.e. weights or other distributed loads are assumed to be distributed to the joints)
- The joints of a truss are all pin connections (no moment resisted)
- All members are ***straight 2 - force members***

## 4/3 METHODS OF JOINTS

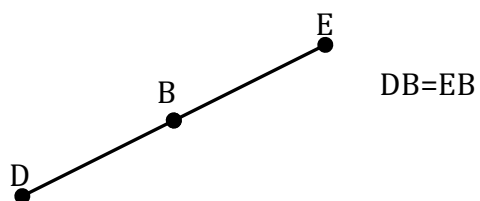


## Special Conditions

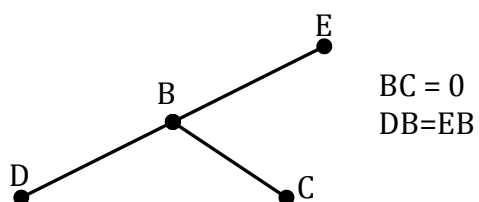


## Zero-force members

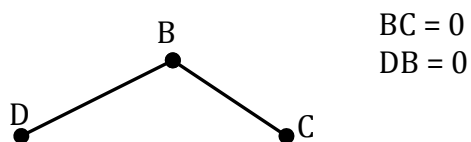
1) joint with 2 in-line (collinear) members with no external force



2) joint with 3 members, 2 of which are in-line (collinear) and no external force



3) joint with 2 non-in-line (noncollinear) members, and no external force



## Example

7-32 through 7-43 Identify all of the zero-force members for the loadings shown in Figs. P7-32 through P7-43.

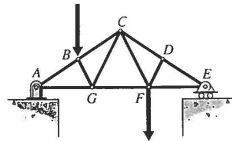


Fig. P7-32

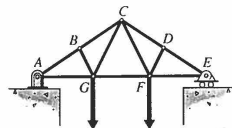


Fig. P7-33

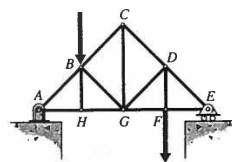


Fig. P7-34

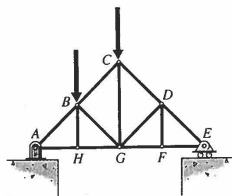


Fig. P7-35

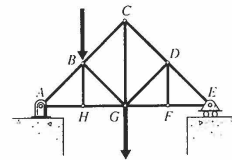


Fig. P7-36

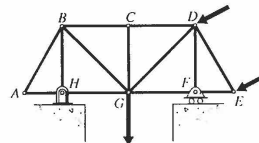


Fig. P7-37

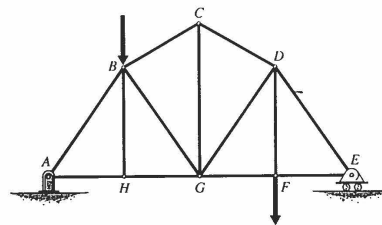


Fig. P7-38

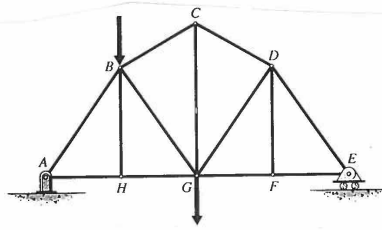


Fig. P7-39

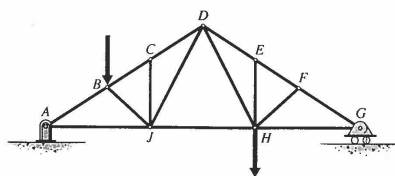


Fig. P7-40

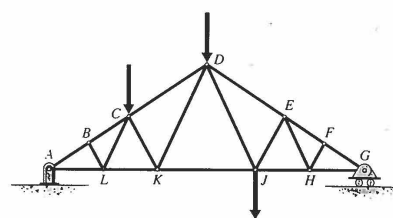


Fig. P7-42

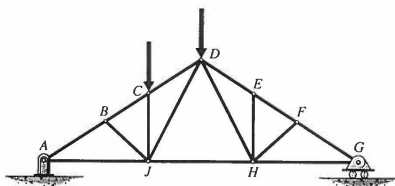


Fig. P7-41

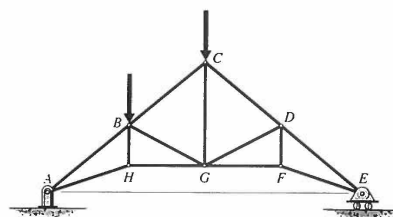


Fig. P7-43

6.15 through 6.17 Determine the zero-force members in the truss shown for the given loading.

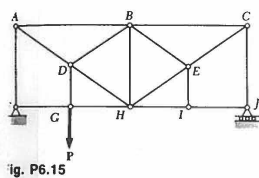


Fig. P6.15

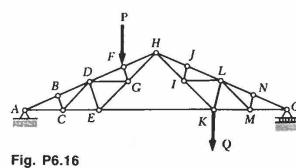


Fig. P6.16

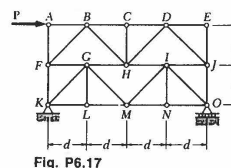
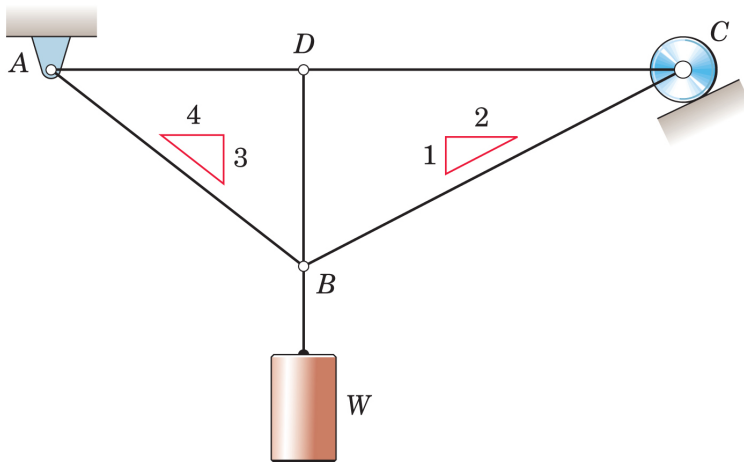


Fig. P6.17



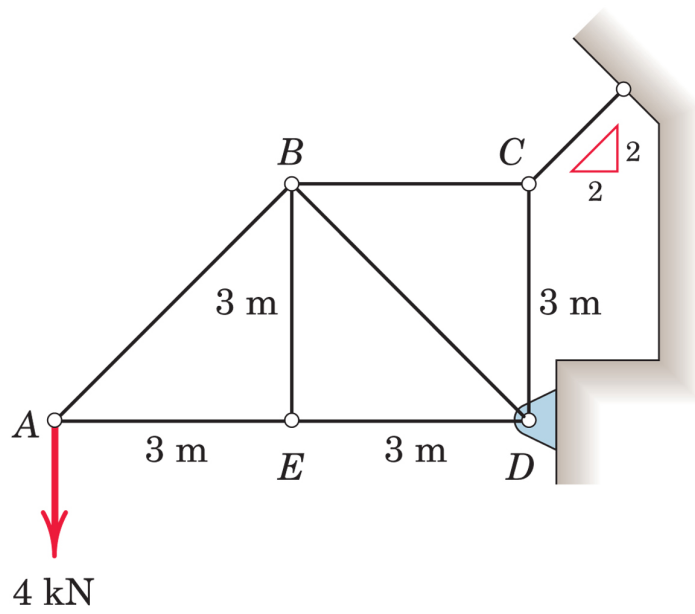
Problem 4/2

Determine the force in each member of the truss as a result of the hanging weight **W**.



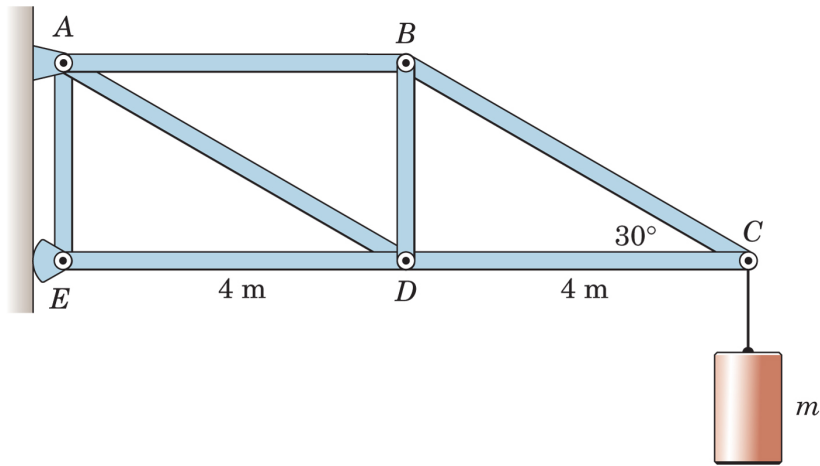
Problem 4/5

Calculate the forces in member BE and BD.



Problem 4/11

If the maximum tensile force in any of the truss members must be limited to 24 kN, and the maximum compressive force must be limited to 35 kN, determine the largest permissible mass  $m$  that may be supported by the truss.



Problem 4/16

Determine the force in each member of the loaded truss. All triangles are 3-4-5.

