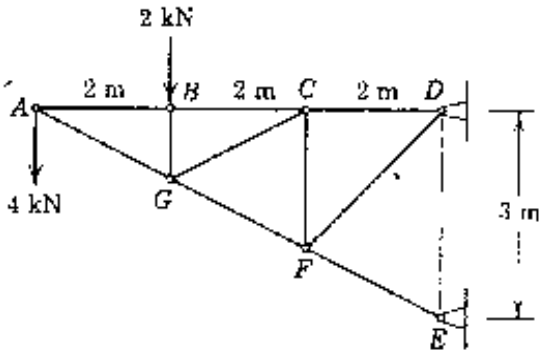
New Problem Sheet No. 3.1

(Truss: Method of Joints)

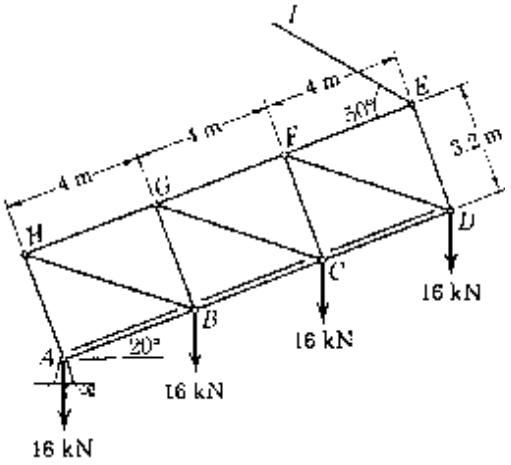
1. Calculate the forces in members CG and CF for the truss shown. If the 2-kN force acting on the truss were removed, identify by inspection those members in which the forces are zero. On the other hand, if the 2-kN force were applied at G instead of B, would there be any zero force members?

   Ans CG = 2.24 kN (T), CF = 1 kN (C)

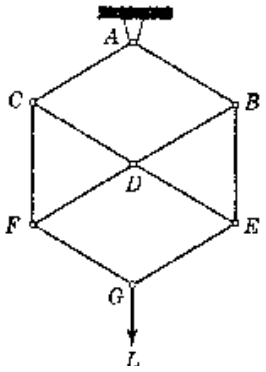


2. The drawbridge is being raised by a cable EI. The four joint loadings shown result from the weight of the roadway. Determine the forces in members EF, DE, DF, CD and FG.

   Ans. EF = 20.6 kN (C)
   DE = 24.6 kN (T)
   DF = 15.27 kN (C)
   CD = 6.45 kN (T)
   FG = 32.5 kN (C)

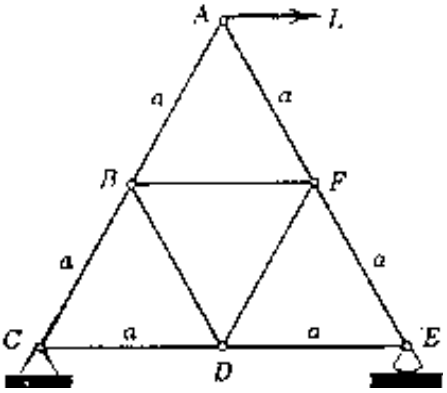


3. Solve for the forces in members BE and BD of the truss which supports the load L. All interior angles are 60° or 120°.



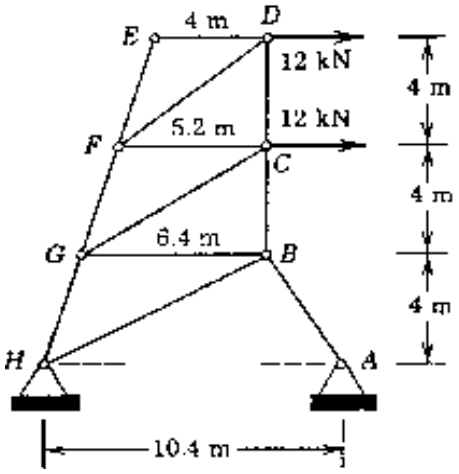
4. The equiangular truss is loaded and supported as shown. Determine the forces in all members in terms of the horizontal load L.

   Ans. AB = BC = L (T), AF = EF = L (C)
   DE = CD = L/2 (T), BF = DF = BD = 0



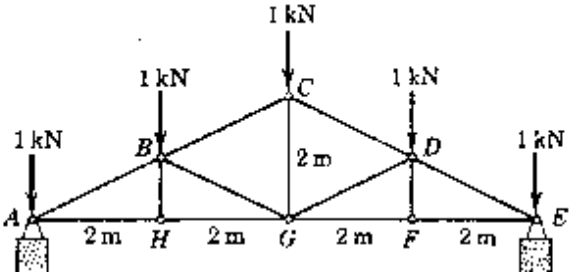
5. Calculate the forces in members CF, CG, EF of the loaded truss.

Ans. CG = 25.0 kN (T)



6. A snow load transfers the forces shown to upper joints of a Howe roof trusses respectively. Neglect any horizontal reaction at the supports and solve for the forces in all members and compare them.

Ans. For Howe roof truss AB = DE = 3.35 kN (C), BC = CD = 2.24 N (C), AH = EF = 3.00 kN (T), BH = DF = 0, GH = FG = 3.0 kN (T), BG = DG = 1.12 kN (C)



7. The tower for a transmission line is modeled by the truss shown. The crossed members in the center sections of the truss may be assumed capable of supporting tension only. For the loads of 1.8 kN applied in the vertical plane, compute the forces induced in members AB, DB and CD.

Ans. AB = 3.89 kN (C), DB = 0,
CD = 0.93 kN (C)