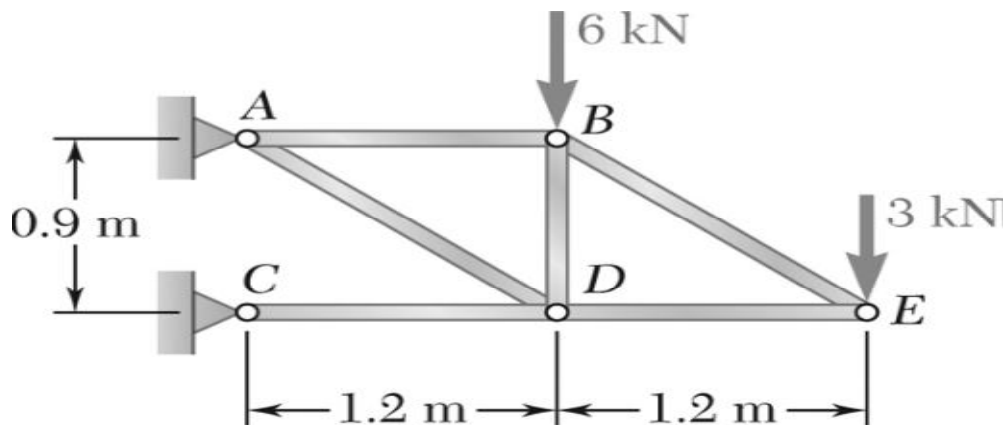


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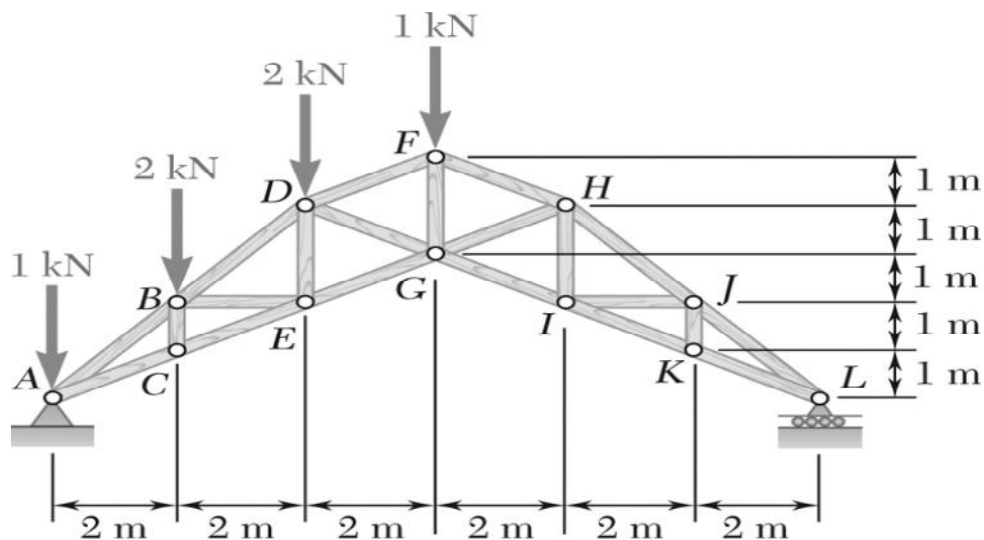
**Engineering Mechanics Tutorial : Truss**

- Using the method of joints, determine the force in each member of the truss shown. State whether each member is in tension or compression



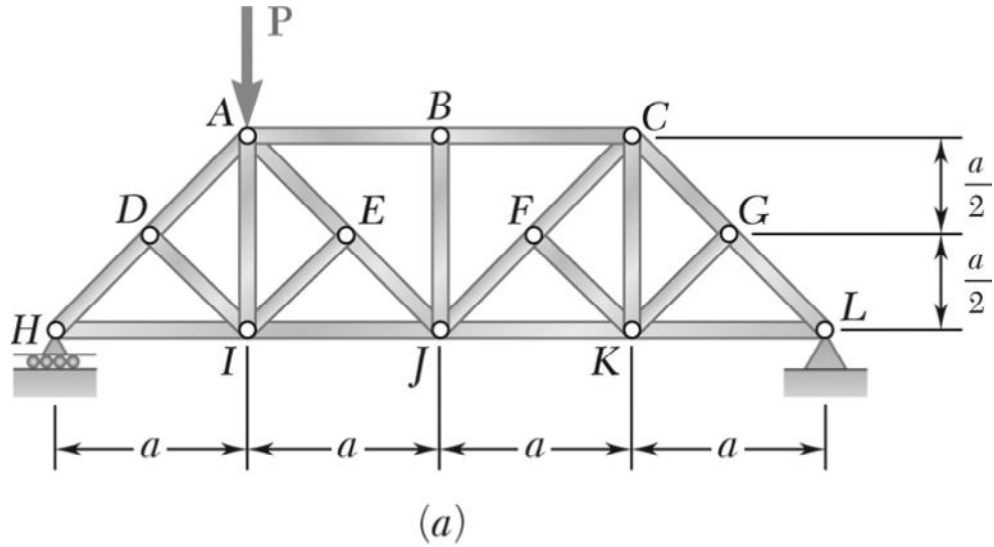
**[Answer:  $F_{AB} = 4\text{ kN (T)}$ ,  $F_{BE} = 5\text{ kN (T)}$ ,  $F_{AD} = 15\text{ kN (T)}$ ,  $F_{CD} = 16\text{ kN (C)}$ ,  $F_{DE} = 4\text{ kN (C)}$ ,  $F_{BD} = 9\text{ kN (C)}$ ]**

- Determine the force in member  $FG$  and in each of the members located to the right of  $FG$  for the scissors roof truss shown. State whether each member is in tension or compression.

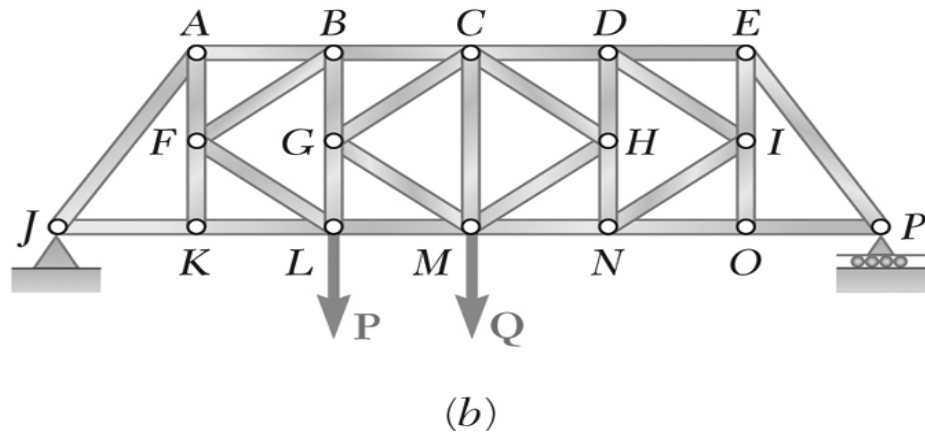


**[Answer:  $F_{HI} = F_{IJ} = F_{JK} = 0$ ,  $F_{JL} = 4.24\text{ kN (C)}$ ,  $F_{KL} = 3.35\text{ kN (T)}$ ,  $F_{IG} = F_{IK} = 3.35\text{ (T)}$ ,  $F_{HJ} = 4.24\text{ kN (C)}$ ,  $F_{DF} = F_{FH} = 5.03\text{ kN (C)}$ ,  $F_{GH} = 1.677\text{ kN (T)}$ ,  $F_{FG} = 3.5\text{ kN (T)}$ ]**

3. For the given loading, determine the zero-force members in each of the two trusses shown.

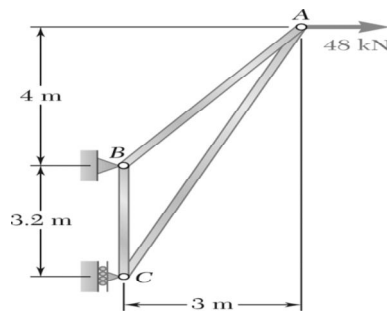


[Answer: members AI, BJ, CK, DI, EI, FK, GK]



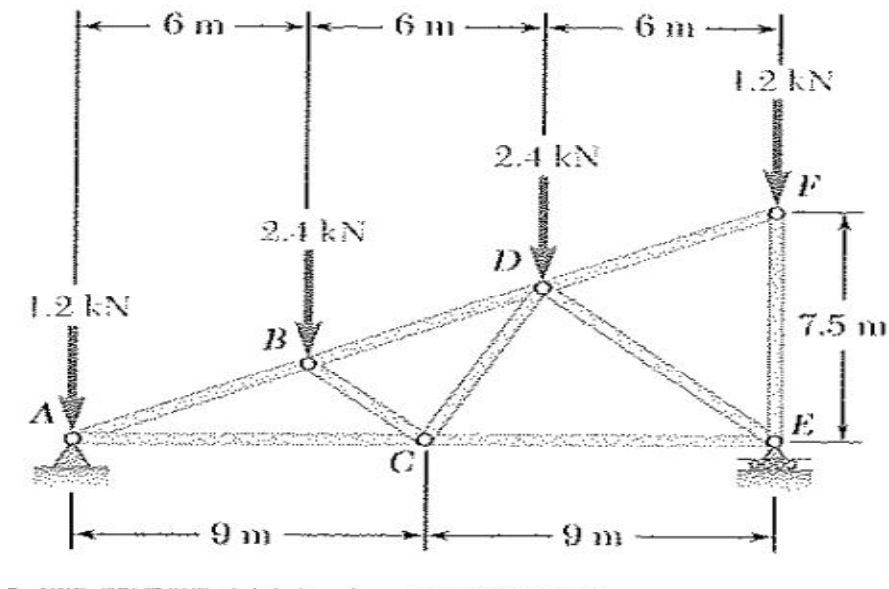
[Answer: members FK & IO]

4. Using the method of joints, determine the force in each member of the truss shown. State whether each member is in tension or compression



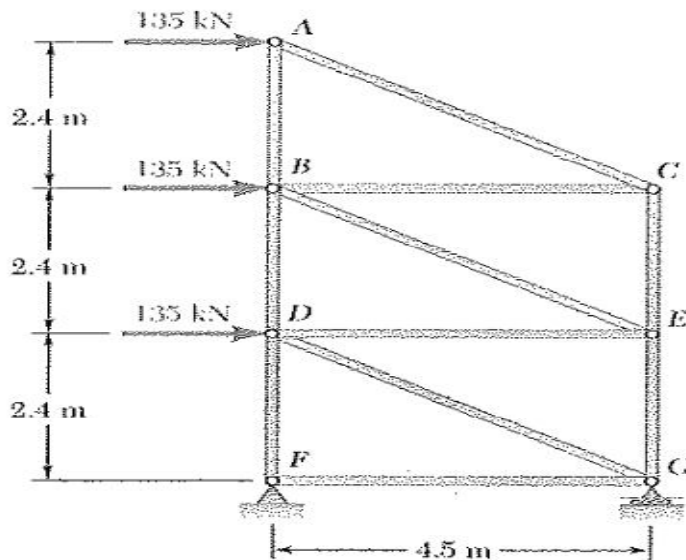
[Answer:  $F_{AB} = 180\text{kN (T)}$ ,  $F_{AC} = 156\text{kN (C)}$ ,  $F_{BC} = 144\text{kN (T)}$ ]

5. Determine the force in each member of the roof truss shown. State whether each member is in tension or compression.



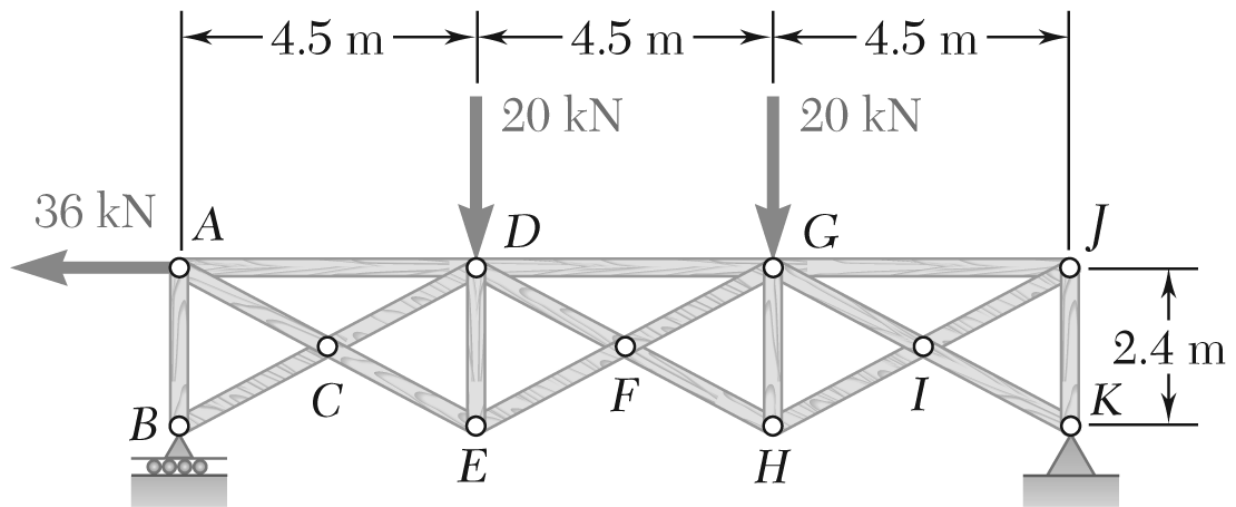
[Answer:  $F_{DF}=0$ ,  $F_{EF}=1.2\text{ kN(C)}$ ,  $F_{AB}=6.24\text{ kN(C)}$ ,  $F_{AC}=2.76\text{ kN(T)}$ ,  $F_{BD}=4.16\text{ kN(C)}$ ,  $F_{BC}=2.5\text{ kN(C)}$ ,  $F_{CD}=1.867\text{ kN(T)}$ ,  $F_{CE}=2.88\text{ kN(T)}$ ,  $F_{DE}=3.75\text{ kN(C)}$ ]

6. Determine the force in members in DG and EG of the truss shown.



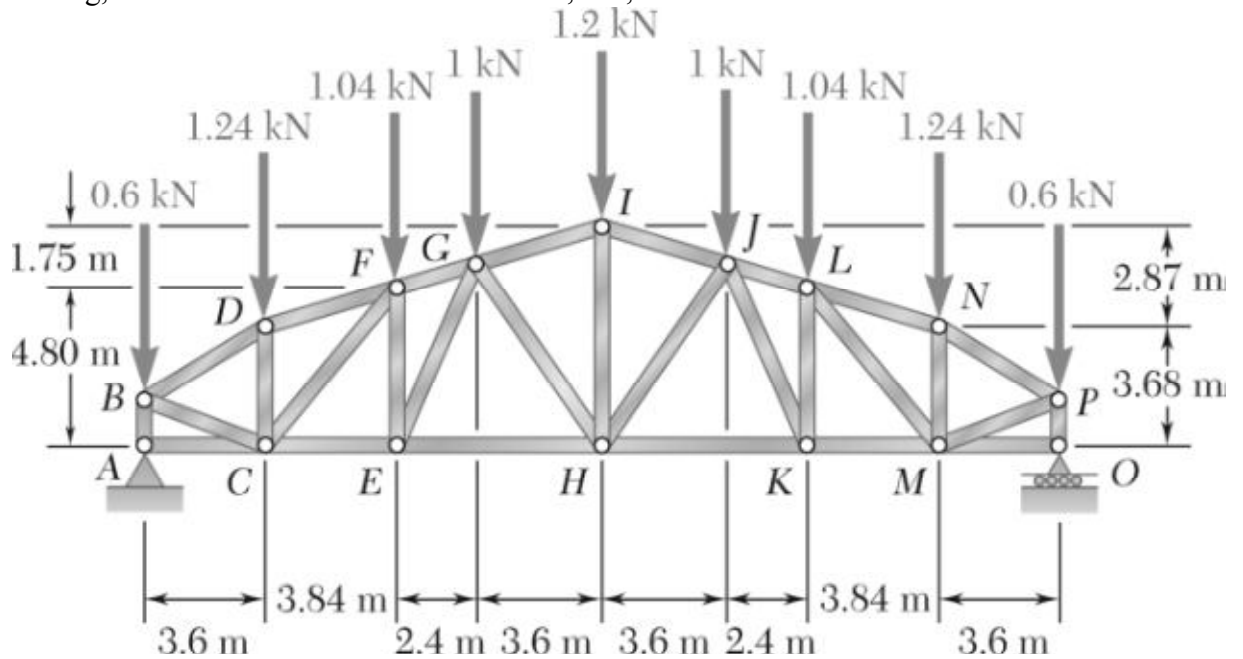
[Answer:  $F_{DG}=459\text{ kN(C)}$ ,  $F_{EG}=216\text{ kN(C)}$ ]

7. Determine the force in members  $DG$ ,  $FG$ , and  $FH$  of the truss shown.



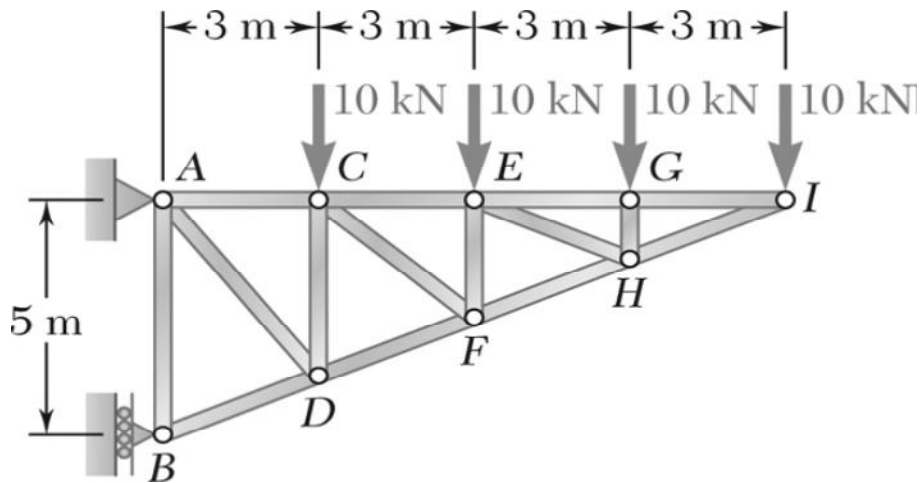
[Answer:  $F_{DG} = 75 \text{ kN (C)}$ ,  $F_{FG} = 56.1 \text{ kN (T)}$ ,  $F_{FH} = 69.7 \text{ kN (T)}$ ]

8. The truss shown was designed to support the roof of a food market. For the given loading, determine the force in members  $KM$ ,  $LM$ , and  $LN$



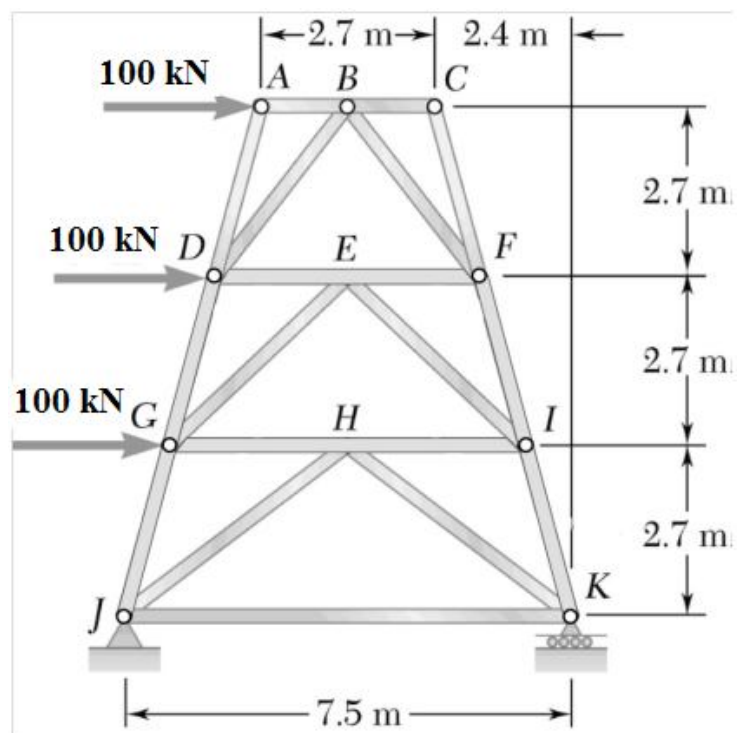
[Answer:  $F_{KM} = 5.02 \text{ kN (T)}$ ,  $F_{LM} = 1.963 \text{ kN (C)}$ ,  $F_{LN} = 3.95 \text{ kN (C)}$ ]

9. Determine the force in members  $CE$  and  $EF$  of the truss shown.



[Answer:  $F_{CE} = 36\text{ kN (T)}$ ,  $F_{EF} = 15\text{ kN (C)}$ ]

10. Use **method of section** to determine the force in members  $JG$  and  $KI$  of the truss shown.



[ Ans.  $F_{JG} = 143.19\text{ kN (T)}$ ,  $F_{KI} = -143.19\text{ kN (C)}$ ]