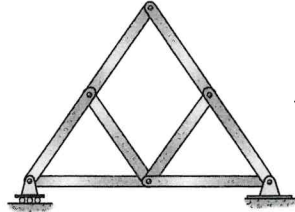


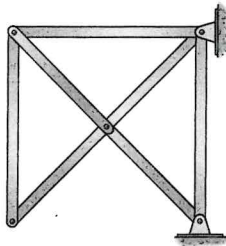
PROBLEMS

Sec. 3.1-3.2

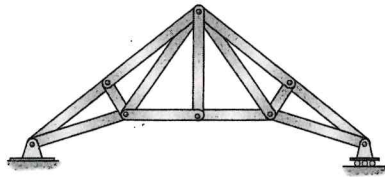
3-1. Classify each of the following trusses as statically determinate, statically indeterminate, or unstable. If indeterminate, state its degree.



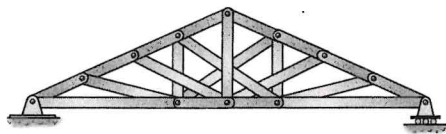
(a)



(b)



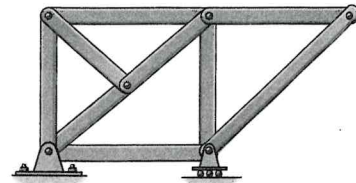
(c)



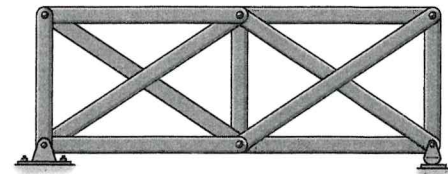
(d)

Prob. 3-1

3-2. Classify each of the following trusses as statically determinate, indeterminate, or unstable. If indeterminate, state its degree.



(a)

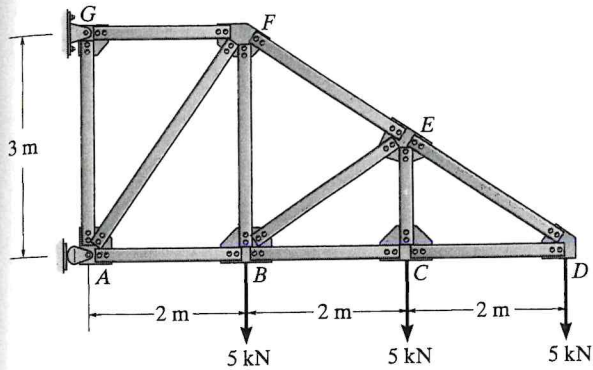


(b)

Prob. 3-2

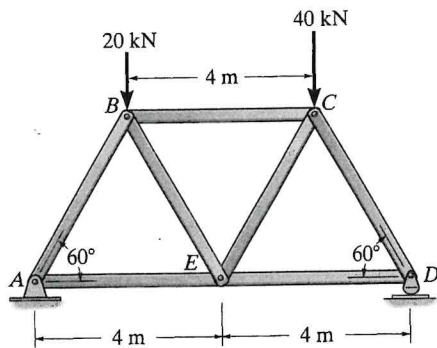
Sec. 3.3-3.4

3-5. Determine the force in each member of the truss. State if the members are in tension or compression. Assume all members are pin connected.



Prob. 3-5

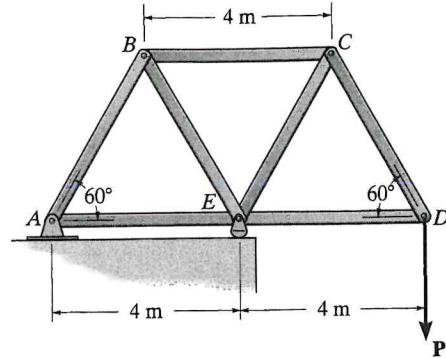
3-6. Determine the force in each member of the truss. State if the members are in tension or compression.



Prob. 3-6

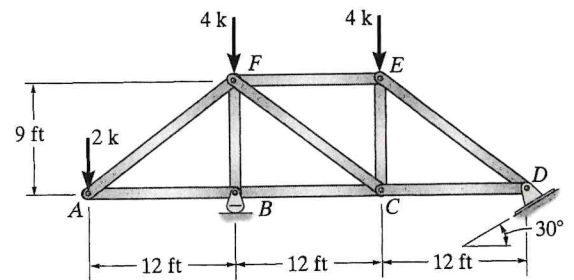
3-7. Determine the force in each member of the truss. State whether the members are in tension or compression. Set  $P = 8 \text{ kN}$ .

\*3-8. If the maximum force that any member can support is 8 kN in tension and 6 kN in compression, determine the maximum force  $P$  that can be supported at joint  $D$ .



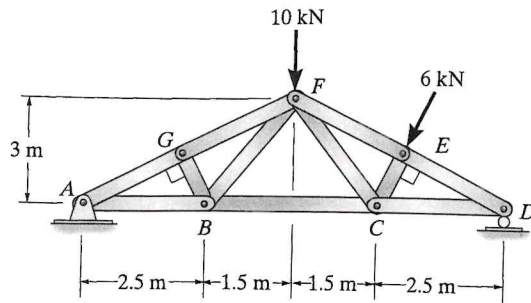
Prob. 3-7/8

3-9. Determine the force in each member of the truss. State if the members are in tension or compression.



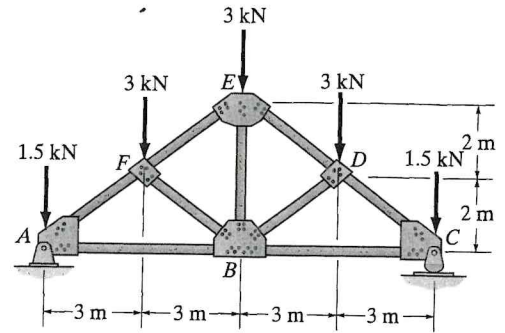
Prob. 3-9

**3-10.** Determine the force in each member of the truss. State if the members are in tension or compression.



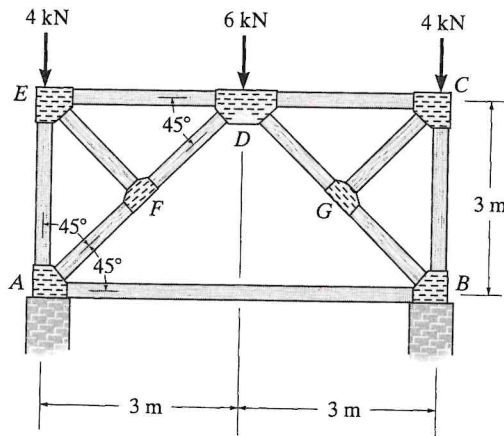
Prob. 3-10

**\*3-12.** Determine the force in each member of the truss. State if the members are in tension or compression. Assume all members are pin connected.



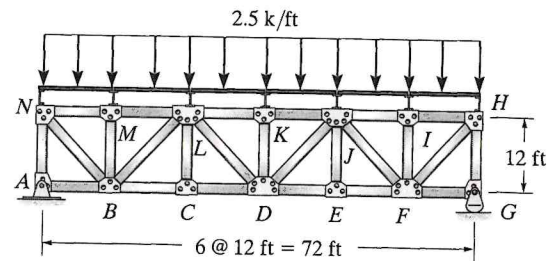
Prob. 3-12

**3-11.** Specify the type of compound truss and determine the force in each member. State if the members are in tension or compression. Assume the members are pin connected.



Prob. 3-11

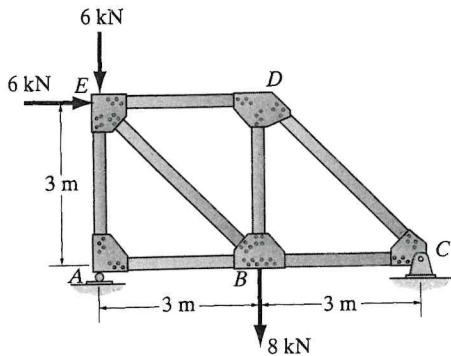
**3-13.** The truss shown is used to support the floor deck. The uniform load on the deck is 2.5 k/ft. This load transferred from the deck to the floor beams, which rest on the top joints of the truss. Determine the force in each member of the truss, and state if the members are in tension or compression. Assume all members are pin connected.



Prob. 3-13

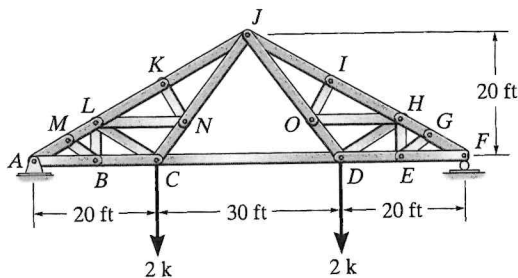
Sec. 3.5-3.6

3-18. Determine the force in members  $ED$ ,  $BD$  and  $BC$  of the truss and indicate if the members are in tension or compression.



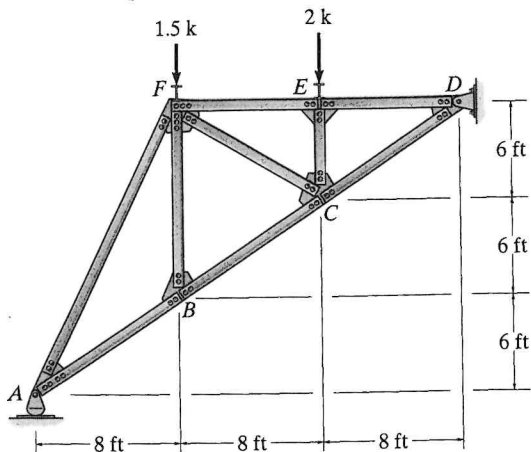
Prob. 3-18

3-19. Determine the force in members  $JK$ ,  $JN$ , and  $CD$ . State if the members are in tension or compression. Identify all the zero-force members.



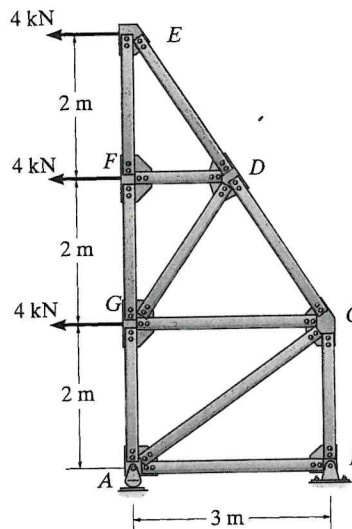
Prob. 3-19

\*3-20. Determine the force in members  $FC$ ,  $BC$ , and  $FE$ . State if the members are in tension or compression. Assume all members are pin connected.



Prob. 3-20

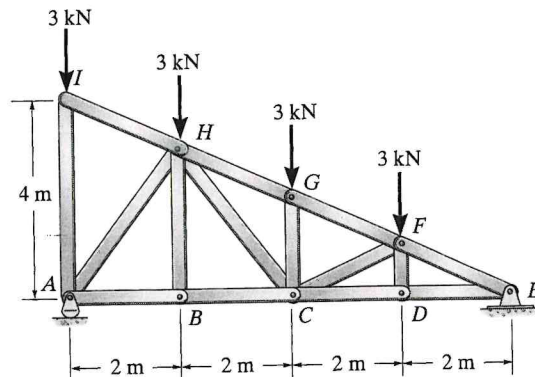
3-21. Determine the force in members  $FG$ ,  $GD$ ,  $CD$  and  $GA$  of the truss. State if the members are in tension or compression.



Prob. 3-21

3-22. Determine the force in members  $HG$ ,  $HC$ ,  $HB$  and  $AB$  of the truss. State if the members are in tension or compression. Assume all members are pin connected.

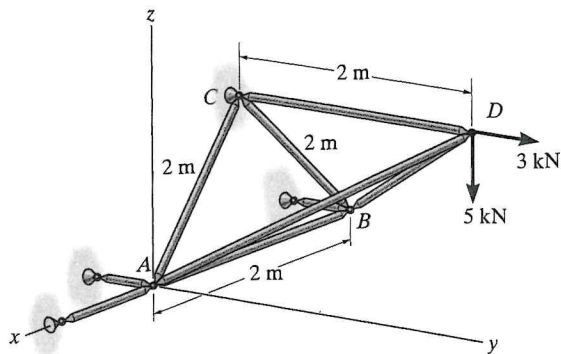
3-23. Determine the force in members  $GF$ ,  $GC$ ,  $HC$  and  $BC$  of the truss. State if the members are in tension or compression. Assume all members are pin connected.



Probs. 3-22/23

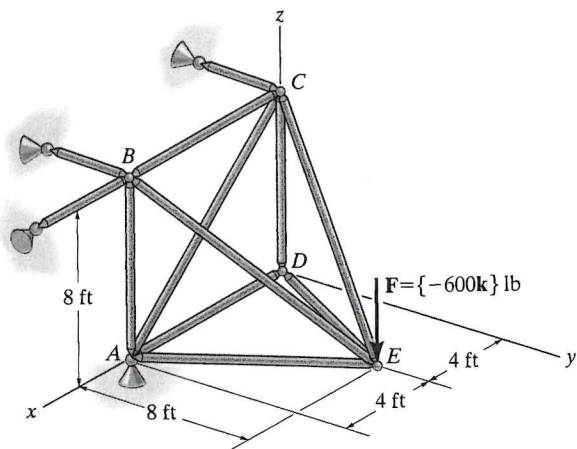
Sec. 3.8

\*3-36. Determine the force in the members of the space truss, and state whether they are in tension or compression.



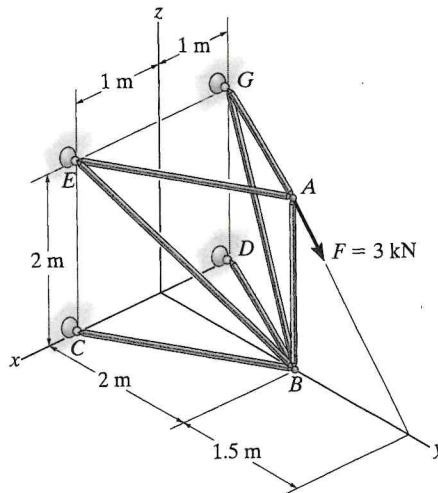
Prob. 3-36

3-37. Determine the force in each member of the space truss and state if the members are in tension or compression. The truss is supported by a ball-and-socket joint at A and short links at B and C.



Prob. 3-37

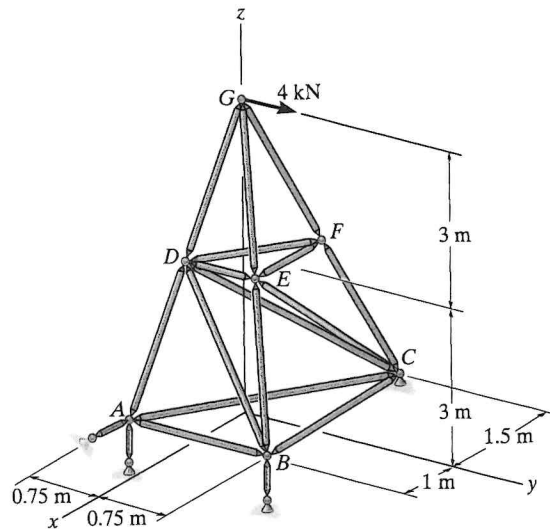
3-38. Determine the force in each member of the space truss and state if the members are in tension or compression. The truss is supported by ball-and-socket joints at C, D, E, and G. Note: Although this truss is indeterminate to the first degree, a solution is possible due to symmetry of geometry and loading.



Prob. 3-38

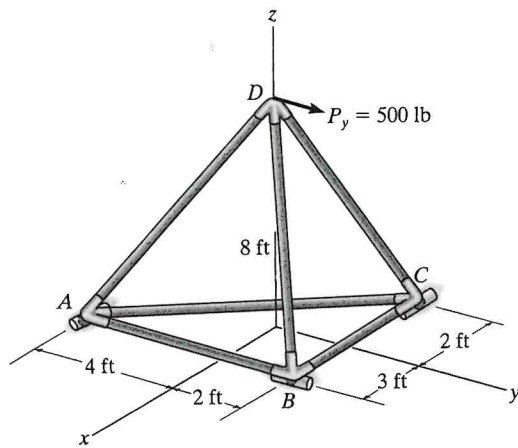
3-39. Determine the force in members FE and ED of the space truss and state if the members are in tension or compression. The truss is supported by a ball-and-socket joint at C and short links at A and B.

\*3-40. Determine the force in members GD, GE, GF and FD of the space truss and state if the members are in tension or compression.



Probs. 3-39/40

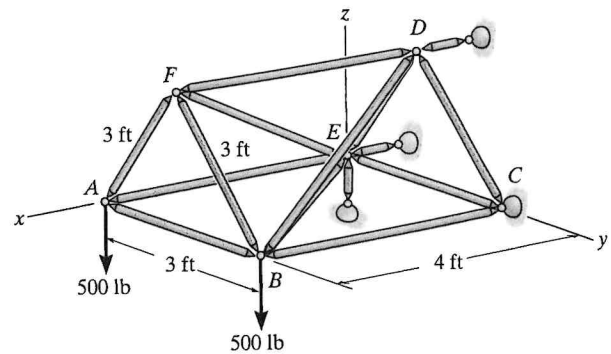
3-41. Determine the reactions and the force in each member of the space truss. Indicate if the members are in tension or compression.



Prob. 3-41

3-42. Determine the force in members  $AB$ ,  $BD$ , and  $FE$  of the space truss and state if the members are in tension or compression.

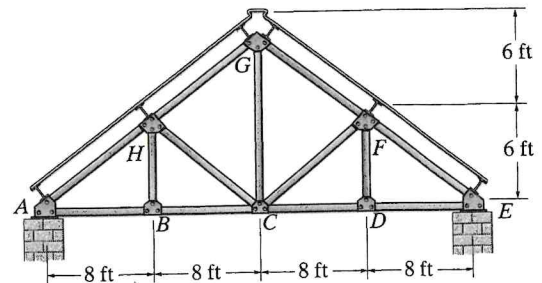
3-43. Determine the force in members  $AF$ ,  $AE$  and  $FD$  of the space truss and state if the members are in tension or compression.



Probs. 3-42/43

## PROJECT PROBLEM

3-1P. The Pratt roof trusses are uniformly spaced every 15 ft. The deck, roofing material, and the purlins have an average weight of  $5.6 \text{ lb/ft}^2$ . The building is located in New York where the anticipated snow load is  $20 \text{ lb/ft}^2$  and the anticipated ice load is  $8 \text{ lb/ft}^2$ . These loadings occur over the horizontal projected area of the roof. Determine the force in each member due to dead load, snow, and ice loads. Neglect the weight of the truss members and assume  $A$  is pinned and  $E$  is a roller.



Project Prob. 3-1P