

Problem Set 8

Problem 8.1. Method of Joints for Truss Analysis

Determine the force in each member of the truss, and state if the members are in tension or compression.

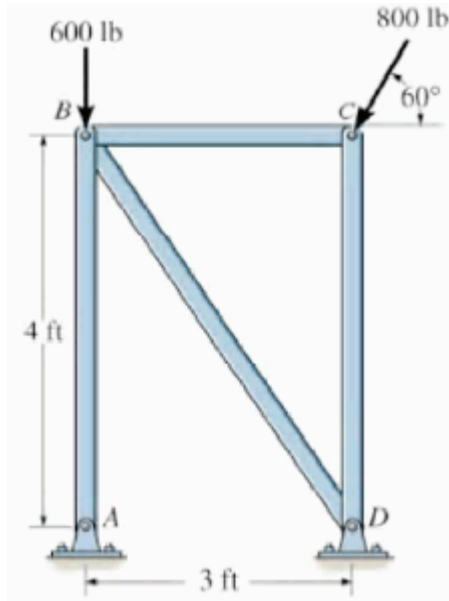


Figure P8.1: Problem 8.1

Problem 8.2. Method of Sections for Truss Analysis

The roof truss supports the loading shown. Determine the force in the members BC , CK , and KJ and state if these members are in tension or compression.

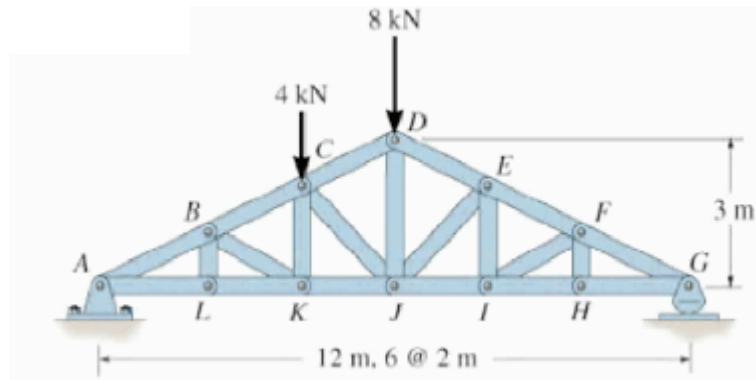
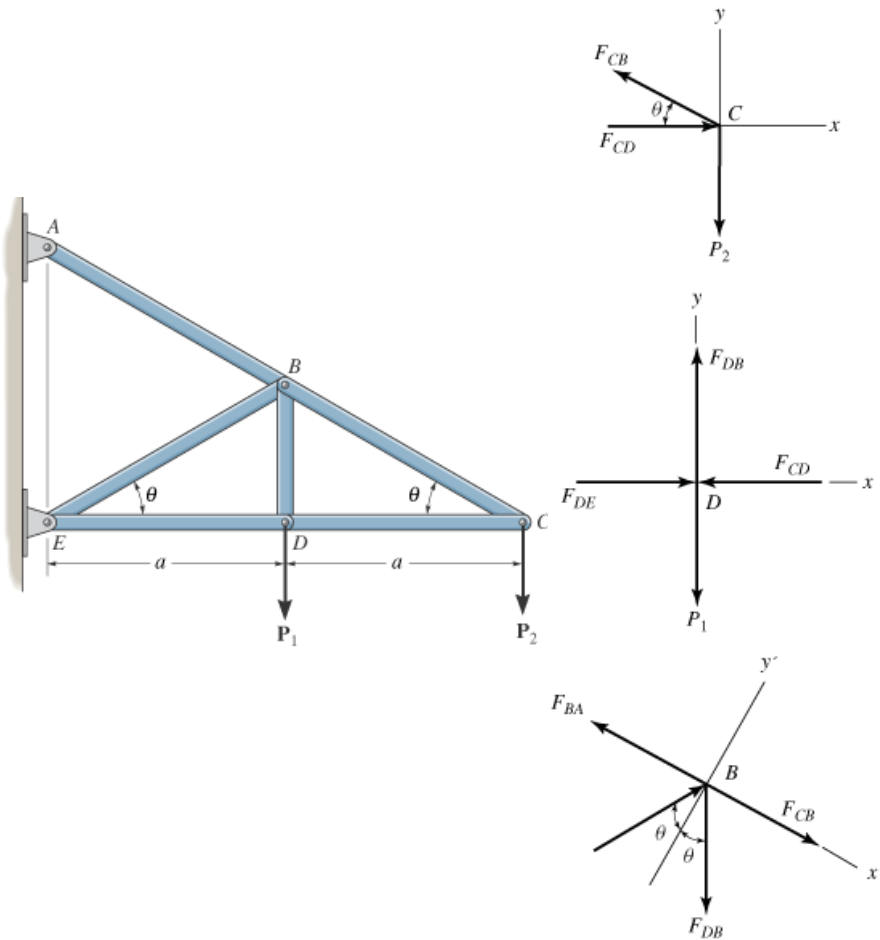


Figure P8.2: Problem 8.2

Problem 8.3

Determine the force in each member of the truss and state if the members are in tension or compression. Given: $P_1 = 4 \text{ kN}$, $P_2 = 4 \text{ kN}$; $a = 3 \text{ m}$; $\theta = 30^\circ$.



$$\begin{aligned}
 F_{CB} &= 8 \text{ [kN] (T)} \\
 F_{CD} &= 6.9282 \text{ [kN] (C)} \\
 F_{DE} &= 6.9282 \text{ [kN] (C)} \\
 F_{DB} &= 4 \text{ [kN] (T)} \\
 F_{BE} &= 4 \text{ [kN] (C)} \\
 F_{BA} &= 12 \text{ [kN] (T)}
 \end{aligned}$$

Problem 8.4

The Howe bridge truss is subjected to the loading shown. Determine the force in members HI , HB , and BC , and state if the members are in tension or compression.

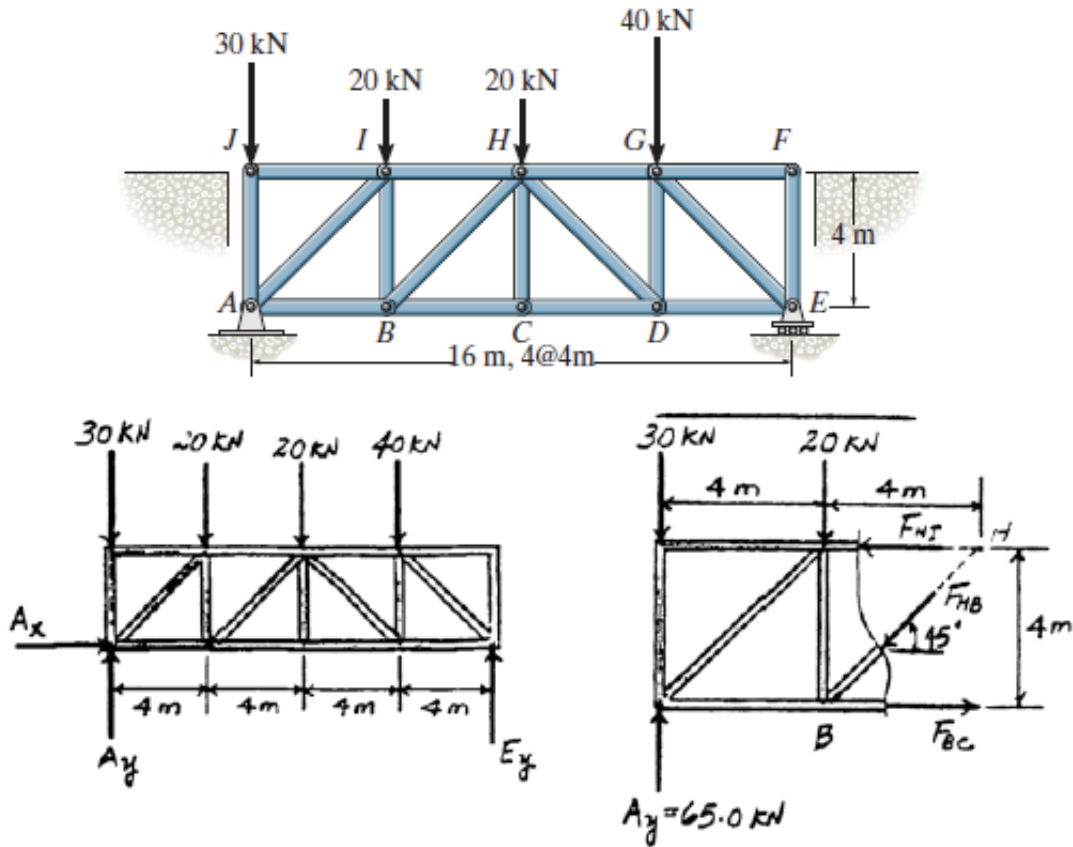


Figure P8.4: Problem 8.4

$$F_{BC} = 50 \text{ [kN] (T)}$$

$$F_{HI} = 35 \text{ [kN] (C)}$$

$$F_{HB} = 21.2 \text{ [kN] (C)}$$

Problem 8.5

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 joints at A , B , and E . Given:

$$F = [F_x, F_y, 0];$$

$$F_x = -200; F_y = 400; [\text{N}]$$

$$a = 2; b = 1.5; c = 5; d = 1; e = 2; [\text{m}]$$

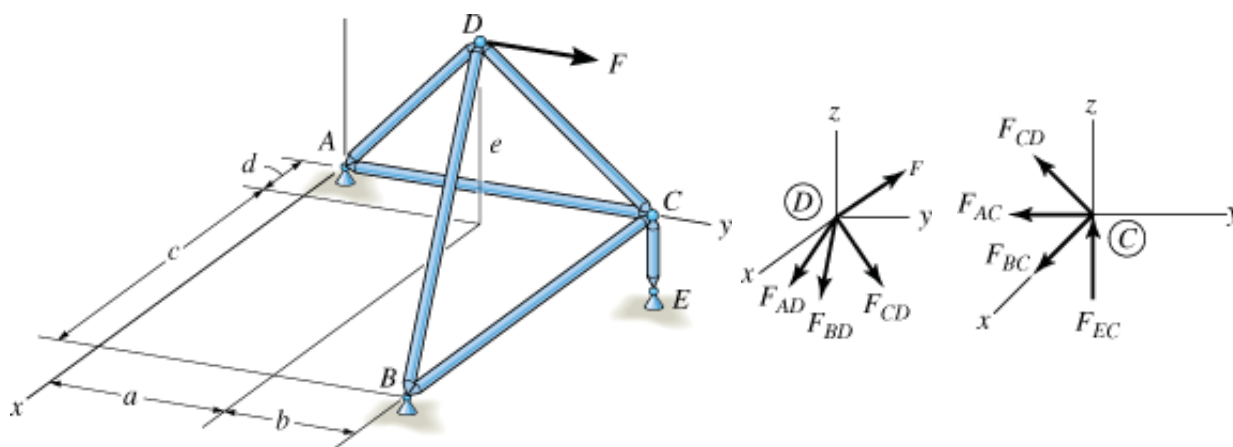


Figure P 8.5: Problem 8.5

Results:

$$F_{AC} = 221 \text{ [N] (T)}$$

$$F_{BC} = 148 \text{ [N] (T)}$$

$$F_{EC} = 295 \text{ [N] (C)}$$