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](image-url)
**Problem 8.3**

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

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

- $F_{BC} = 50$ [kN] (T)
- $F_{HI} = 35$ [kN] (C)
- $F_{HB} = 21.2$ [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:

\[ \mathbf{F} = [F_x, F_y, 0]; \]
\[ F_x = -200; \quad F_y = 400; \quad [\text{N}] \]
\[ a = 2; \quad b = 1.5; \quad c = 5; \quad d = 1; \quad e = 2; \quad [\text{m}] \]

Results:

- FAC = 221 [N] (T)
- FBC = 148 [N] (T)
- FEC = 295 [N] (C)

Figure P 8.5: Problem 8.5