6.52

**Given:** Pitched flat roof truss with loading shown.

**Find:** Force in members EH, GH, and HJ.

**Reactions at supports:** Because of the symmetry of the loading, $A_x = 0$, $A_y = J = \frac{1}{2} (\text{total load}) = \frac{1}{2} (8 \text{ kN}) = 4 \text{ kN}$.

We pass a section through members EG, GH, and HJ, and use the free body shown.

\[ +\Sigma M_H = 0: \]
\[ (4 \text{ kN})(2.4 \text{ m}) - (1 \text{ kN})(2.4 \text{ m}) - F_{EH} (2.08 \text{ m}) = 0 \]
\[ F_{EH} = +3.4615 \text{ kN} \quad F_{EG} = 3.46 \text{ kN} \]

\[ -\Sigma M_J = 0: \]
\[ -F_{GH} (2.4 \text{ m}) - F_{EG} (2.62 \text{ m}) = 0 \]
\[ F_{GH} = \frac{2.62 (3.4615 \text{ kN})}{2.4} \quad F_{GH} = -3.7788 \text{ kN} \quad F_{GH} = 3.78 \text{ kN} \]

\[ -\Sigma F = 0: \]
\[ -F_{EH} - \frac{2.46}{2.46} F_{HJ} = 0 \]
\[ F_{HJ} = -\frac{2.46}{2.46} F_{EG} = -\frac{2.46}{2.4} (3.4615 \text{ kN}) \quad F_{HJ} = -3.548 \text{ kN} \quad F_{HJ} = 3.55 \text{ kN} \]