1. Draw the deflected shape of the truss to the right and write C or T next to each chord to indicate if it is in compression (C) or tension (T).

**Answer:**

![Diagram of the deflected truss with C and T labels]
2. Calculate the bar forces in the truss and write the magnitude and sign (C or T) of each bar force directly on the figure.

Answers:

Solution:

Label joints and member
Calculate reactions:

\[ \Sigma F_H = 0, \quad 18^k + R_{1H} = 0, \quad R_{1H} = -18^k \]

\[ \Sigma M_1 = 0, \quad 18^k (33') - R_{2V} (24') = 0, \quad R_{2V} = 24.75^k \]

\[ \Sigma F_V = 0, \quad 24.75^k + R_{1V} = 0, \quad R_{1V} = -24.75^k \]

Since every joint has two bar forces in each direction, use method of sections.

Method of Sections: cut Members 1 & 2 and sum moments about Joint 4:

\[ +\Sigma M_4 = 0, \quad -18^k (12') + 24.75^k (21') - f_{2V} (9') - f_{2H} (12') = 0 \]

By similar triangles:

\[ \frac{f_{2V}}{f_2} = \frac{9}{15'}, \quad f_{2V} = \frac{9}{15} f_2 \]

and

\[ \frac{f_{2H}}{f_2} = \frac{12'}{15'}, \quad f_{2H} = \frac{12}{15} f_2 \]

\[ 303.75^{k-ft} - \frac{9}{15} f_2 (9') - \frac{12}{15} f_2 (12') = 0, \quad f_2 = 20.25^k \]

\[ f_2 = 20.25^k \text{ T} \] (since \( f_2 \) is positive, it is in tension)

Method of Joints: Joint 1:

\[ +\Sigma F_V = 0 \]

\[ f_{1V} + 20.25^k (9/15) - 24.75^k = 0 \]

\[ \frac{f_{1V}}{f_1} = \frac{21}{21.213}, \quad f_{1V} = \frac{21}{21.213} f_1 \]

\[ \frac{21}{21.23} f_1 - 12.60^k = 0, \quad f_1 = -12.73^k \]

\[ f_1 = 12.73^k \text{ T} \]
Method of Joints: Joint 6:

\[ + \sum F_v = 0, \]
\[ -f_{8v} - f_{9v} = 0 \]
\[ - \frac{12}{15} f_8 - \frac{12}{15} f_9 = 0, \quad f_8 = -f_9 \]

\[ + \sum F_H = 0 \]
\[ 18k - f_{8h} + f_{9h} = 0 \]
\[ 18k - \frac{9}{15} f_8 + \frac{9}{15} f_9 = 0 \]
\[ 18k - \frac{9}{15} (-f_9) + \frac{9}{15} f_9 = 0 \]
\[ 18k + f_9 \left[ \frac{9}{15} + \frac{9}{15} \right] = 0, \quad f_9 = -15k, \; f_8 = 15k \]

\[ f_8 = 15k \text{ T} \]

\[ f_9 = 15k \text{ C} \]