6.18

**GIVEN:**
INVERTED HOME ROOF TRUSS AND LOADING SHOWN.
FIND:
FORCE IN MEMBERS TO THE RIGHT OF DE.

**FREE BODY: TRUSS**

\[ \Sigma M_A = 0: \]
H(4d) = -(800 lb)(d) - (800 lb)(2d) - (400 lb)(4d) = 0
H = 1600 lb

ANGLES:
\[ \tan \alpha = \frac{6.72}{10.54} \quad \alpha = 32.52^\circ \]
\[ \tan \beta = \frac{6.72}{23.04} \quad \beta = 16.26^\circ \]

**FREE BODY: JOINT H**

\[ \Sigma F_x = 0: \]
\[ -F_{FH} - (800 \text{ lb}) \cos 16.26^\circ = 0 \]
\[ F_{FH} = -768.0 \text{ lb} \quad F_{FH} = 768 \text{ lb} \]

\[ \Sigma F_y = 0: \]
\[ +F_{FH} + 4285.8 \text{ lb} = 0 \]
\[ F_{FH} = -4285.8 \text{ lb} \quad F_{FH} = 4285.8 \text{ lb} \]

**FREE BODY: JOINT F**

\[ \Sigma F_x = 0: \]
\[ -F_{FG} - (800 \text{ lb}) \sin 16.26^\circ = 0 \]
\[ F_{FG} = -4061.8 \text{ lb} \quad F_{FG} = 4061.8 \text{ lb} \]

**FREE BODY: JOINT G**

\[ \Sigma F_x = 0: \]
\[ -F_{FG} + 1371.4 \text{ lb} = 0 \]
\[ F_{FG} = 1371.4 \text{ lb} \]

\[ \Sigma F_y = 0: \]
\[ F_{EG} + 4114.3 \text{ lb} - (768.0 \text{ lb}) \sin 16.26^\circ = 0 \]
\[ F_{EG} = 2742.9 \text{ lb} \quad F_{EG} = 2740.1 \text{ lb} \]