P3.37. The multi-span girder in Figure P3.37 has two shear plate connections that act as hinges at C and D. The mid-span girder CD is simply supported on the cantilevered ends of the left and right girders. Determine the forces in the hinges and the reactions at supports A, B, E and F.

\[ w = 6 \text{ kips/ft} \]

**FBD "CD"**

**Force in Hinges**

\[ C_Y = D_Y = 6 \times (24) = 72 \text{ kips} \]

\[ C_Y = 24' \]

**FBD "ABC"**

\[ E_Y = 72' \]

\[ \Sigma M_A = 0; \]

\[ 6 \times 48' \times (48')^2 + 72' (48') - B_Y (40') = 0 \]

\[ B_Y = 259.2 \text{ kips} \]

\[ \Sigma F_Y = 0; \]

\[ A_Y - 6 \times 48' + B_Y - 72' = 0 \]

\[ A_Y = 100.8' \]

**FBD "DEFG"**

\[ D_Y = 72' \]

\[ \Sigma M_E = 0; \]

\[ -72' (8') + 318' (18.5') - F_Y (40') = 0 \]

\[ F_Y = 132.7' \]

\[ \Sigma F_Y = 0; \]

\[ -72' - 318' + E_Y + 132.7' = 0 \]

\[ E_Y = 257.3' \]