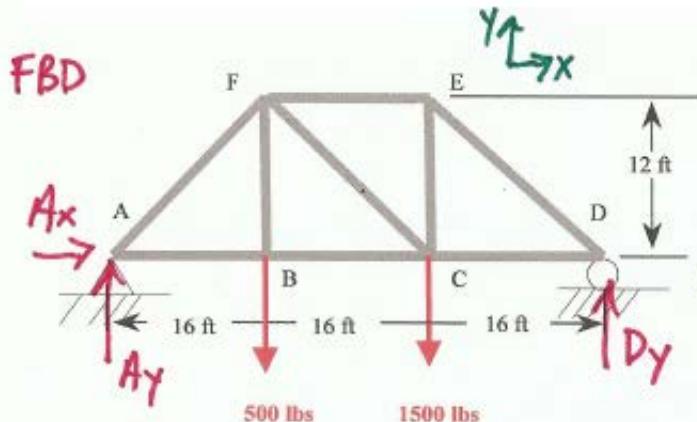


Problem 1 - Trusses I

Determine the internal forces in members AB, AF, FE, FC and BC for the truss shown.



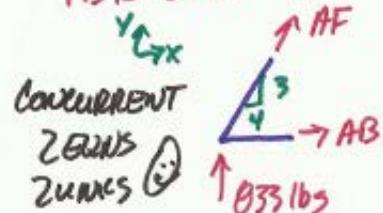
EXTERNAL

NONCONCURRENT
3 EQNS
3 UNKS

$$\begin{aligned} \sum M_D &= 0 \\ 4B'A_y - 32(500\text{ lb}) - 16(1500\text{ lb}) &= 0 \\ A_y &= 833 \text{ lb} \uparrow \\ \rightarrow \sum F_x &= 0 \quad A_x = 0 \end{aligned}$$

BALATE JOINTS

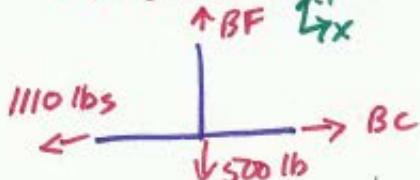
FBD JOINT A



$$\begin{aligned} \uparrow \sum F_y &= 0 = 833 + \frac{3}{5}AF \\ AF &= -1300 = \underline{1300 \text{ lb (C)}} \end{aligned}$$

$$\rightarrow \sum F_x = 0 = AB + \frac{4}{5}AF \\ AB = 1110 \text{ lb (T)}$$

FBD JOINT B

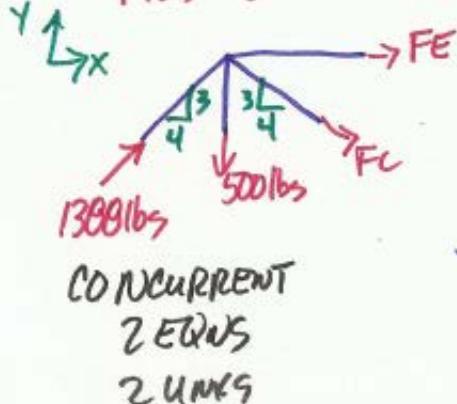


NONCONCURRENT

2 EQNS
2 UNKS

$$\begin{aligned} \uparrow \sum F_y &= 0 = -500 + BF \\ BF &= 500 \text{ lb (T)} \\ \rightarrow \sum F_x &= 0 = -1110 + BC \\ BC &= 1110 \text{ lb (T)} \end{aligned}$$

FBD JOINT F



$$\uparrow \sum F_y = 0 = \frac{3}{5}(1300\text{ lb}) - 500\text{ lb} - \frac{3}{5}FC$$

$$FC = 555 \text{ lb (T)}$$

$$\rightarrow \sum F_x = 0 = \frac{4}{5}(1300\text{ lb}) + \frac{4}{5}FC + FE$$

$$FE = -1554 = \underline{1554 \text{ lb (C)}}$$