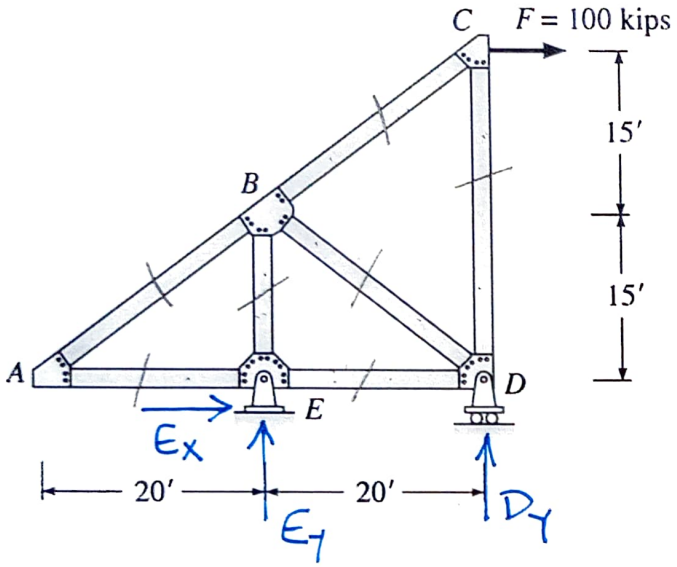
Example 3b-4. Determine all the forces in the following truss.



$\circlearrowleft \sum M_E = 0 = -100^k(30') + D_y(20')$

$D_y = 150^k$

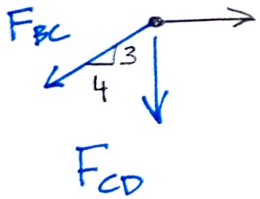
$+\uparrow \sum F_y = 0 = E_y + D_y$ $\quad E_y = -150^k$

$\overset{+}{\rightarrow} \sum F_x = 0 = E_x + 100^k$ $\quad E_x = -100^k$

CASE I ZERO-FORCE MEMBERS

$F_{AE} = F_{AB} = 0$

JOINT C



$\overset{+}{\rightarrow} \sum F_x = 0$

$= -\frac{4}{5}F_{BC} + 100^k$

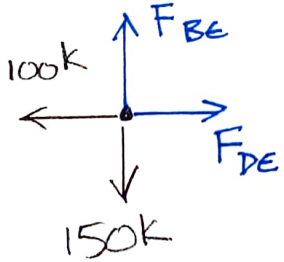
$F_{BC} = 125^k$

$+\uparrow \sum F_y = 0$

$= -F_{CD} - \frac{3}{5}F_{BC}$

$F_{CD} = -75^k$

JOINT E



$+\uparrow \sum F_y = 0$

$= F_{BE} - 150^k$

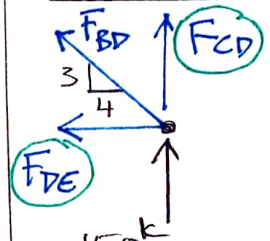
$F_{BE} = 150^k$

$\overset{+}{\rightarrow} \sum F_x = 0$

$= F_{DE} - 100^k$

$F_{DE} = 100^k$

JOINT D



$\overset{+}{\rightarrow} \sum F_x = 0$

$= -F_{DE} - \frac{4}{5}F_{BD}$

$F_{BD} = -125^k$