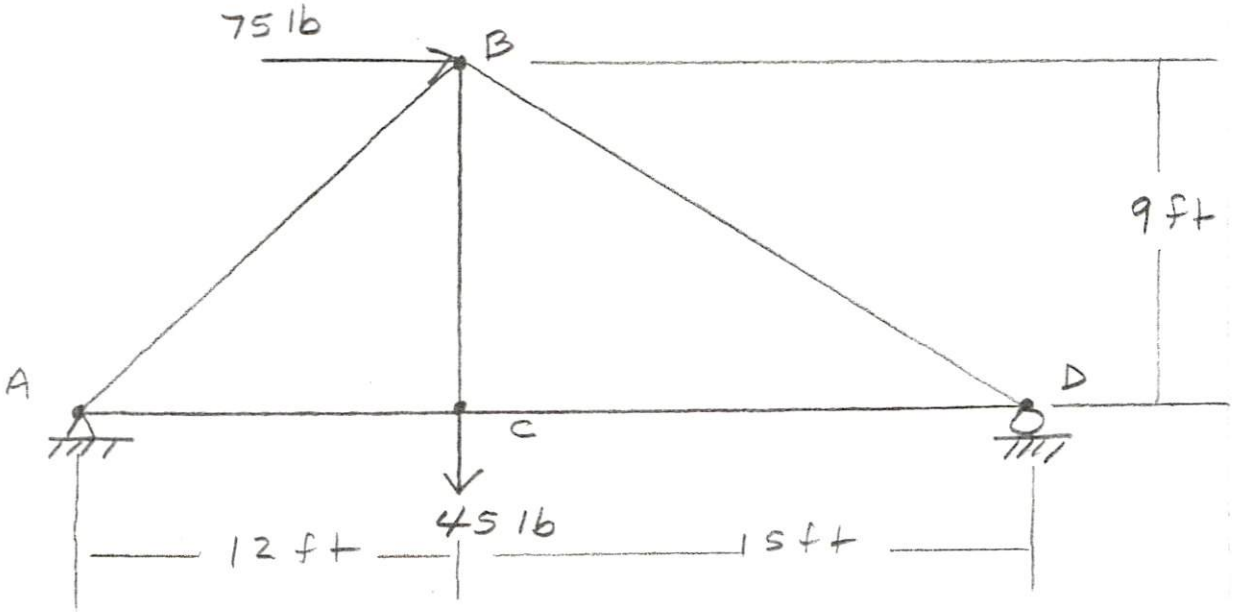
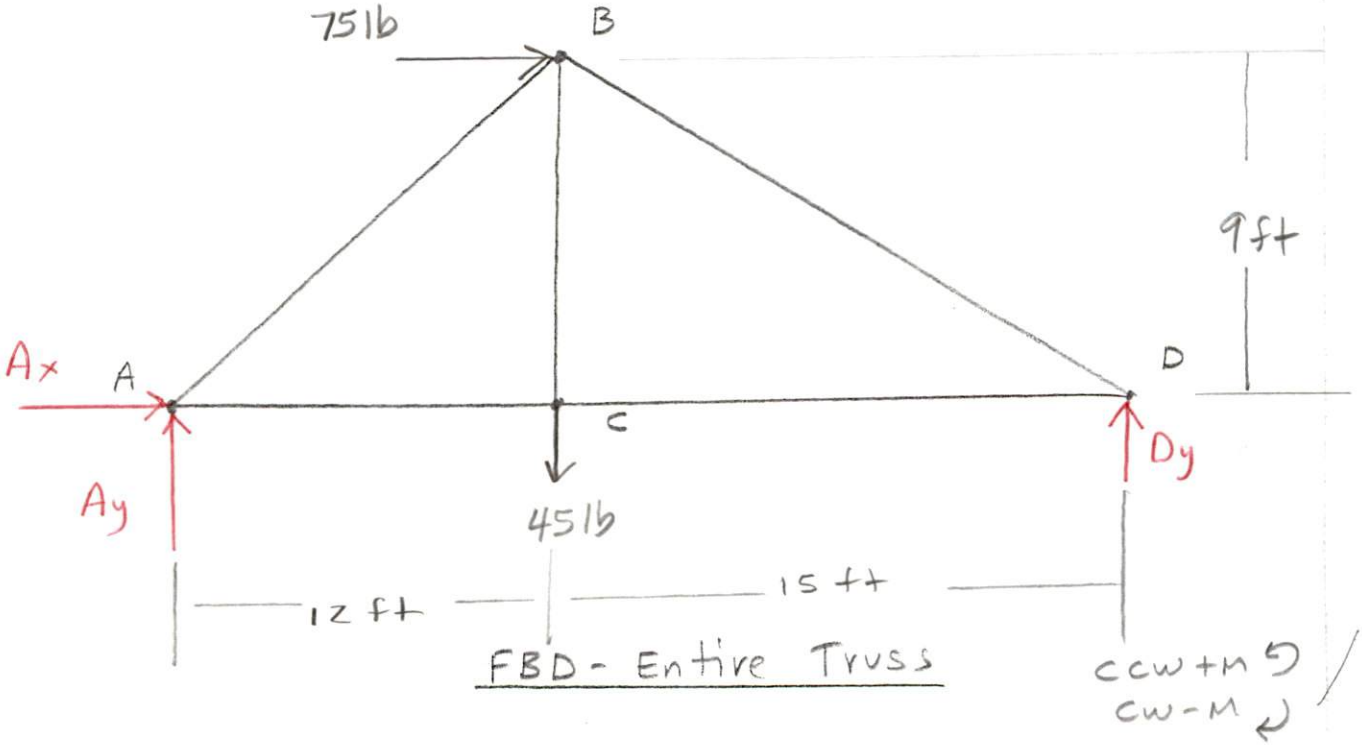
1. Complete the following steps to determine the force in each member of the truss using the Method of Joints



A. Complete the FBD



13. use the following equilibrium equations to determine the reactions at A and D.

$[\Sigma M_A = 0]$

$$-751b(9ft) - 451b(12ft) + D_y(27ft) = 0$$

$$D_y = \frac{1215\ lb \cdot ft}{27\ ft} = \underline{\underline{45\ lb\ \uparrow}}$$

$[\Sigma F_x = 0]$

$$A_x + 75\,lb = 0$$

$$A_x = -75\,lb \rightarrow$$

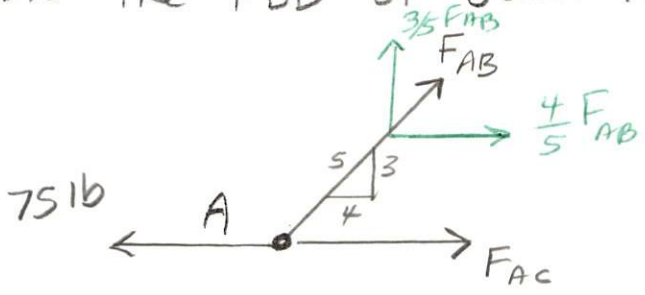
and $\boxed{A_x = 75\,lb \leftarrow}$

$[\Sigma F_y = 0]$

$$A_y - 45\,lb + D_y = 0$$

$$A_y = 45\,lb - 45\,lb = \underline{\underline{0}}$$

C. Complete the FBD of Joint A



D. Using the FBD for Joint A determine the force in members AB and AC.

$[\Sigma F_y = 0]$

$$\frac{3}{5} F_{AB} = 0$$

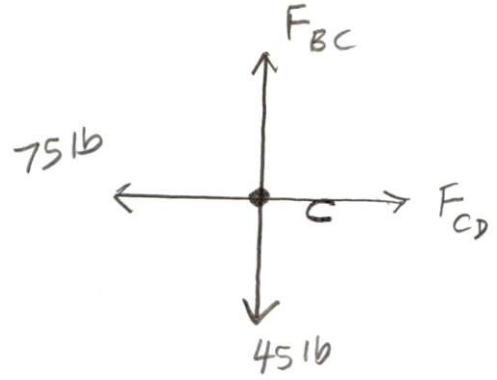
$$F_{AB} = 0$$

$[\Sigma F_x = 0]$

$$-7516 + F_{AC} = 0$$

$$F_{AC} = 7516 \text{ (T)}$$

E. complete the FBD for Joint C



F. using the FBD for Joint C determine the force in members BC and CD.

$[\Sigma F_x = 0]$ $\quad -75\text{ lb} + F_{CD} = 0$

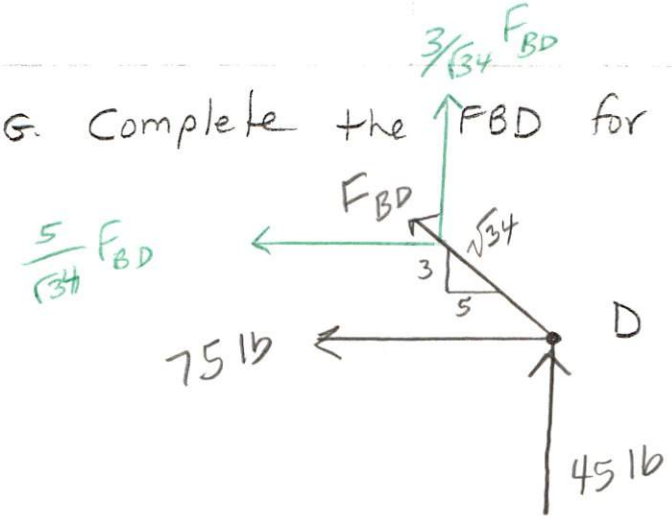
$$F_{CD} = 75\text{ lb (T)}$$

$[\Sigma F_y = 0]$

$$-45\text{ lb} + F_{BC} = 0$$

$$F_{BC} = 45\text{ lb (T)}$$

G. Complete the FBD for Joint D



H. Using the FBD for Joint D determine the force in member BD

$(\Sigma F_y = 0)$

$$\frac{3}{\sqrt{34}} F_{BD} + 45\,lb = 0$$

$$F_{BD} = -\frac{\sqrt{34}(45\,lb)}{3}$$

$$= -87.5\,lb\ (T)$$

and $\boxed{F_{BD} = 87.5\,lb\ (C)}$