$$\vec{F}_{CD} = F_{CD}\vec{\lambda} \qquad F_{CDy} = F_{CD}\lambda_y \qquad F_{CD} = \frac{F_{CDy}}{\lambda_y}$$

6.45 Determine the force in members *BD* and *CD* of the truss shown.

$\Sigma M_C = 0$

6.46 Determine the force in members *DF* and *DG* of the truss shown.

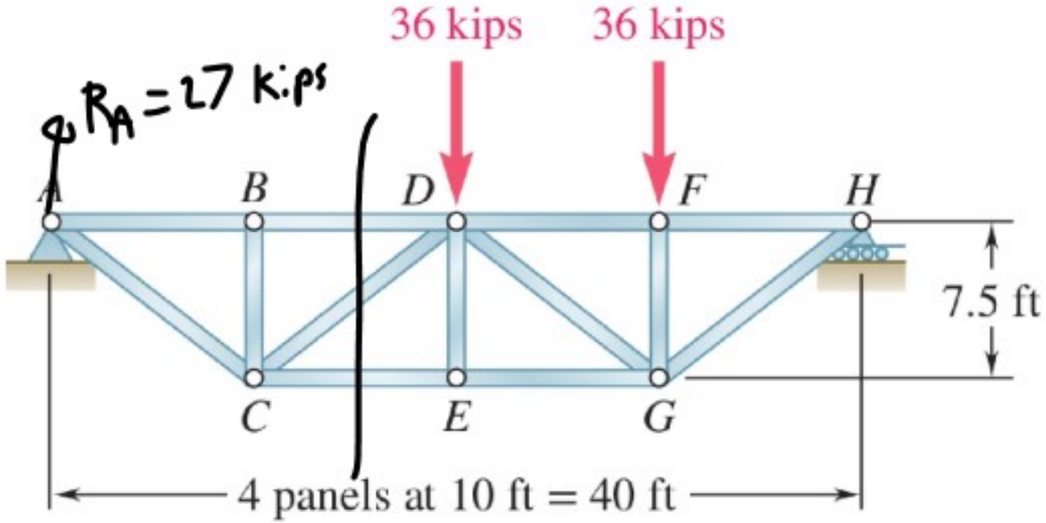
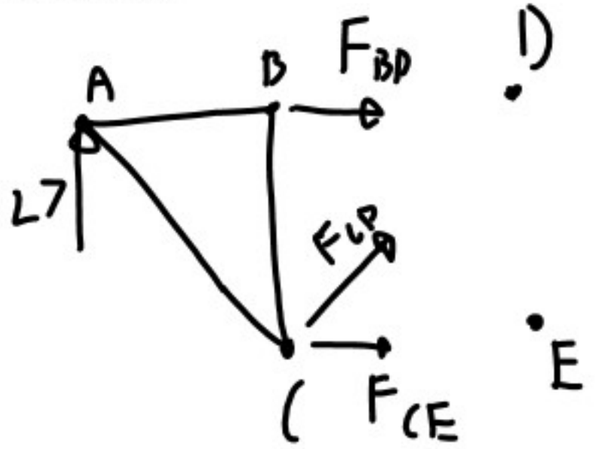


Fig. P6.45 and P6.46

$-10 \cdot 27 - 7.5 F_{BD} = 0$

$-10 \cdot 27 = 7.5 F_{BD}$

$\frac{-10 \cdot 27}{7.5} = -36 \text{ kips} = F_{BD}$



$\Sigma F_y = 27 + F_{CDy} = 0$

$F_{CDy} = -27$

$F_{CD} = \frac{-27}{7.5/12.5}$

$\vec{CD} = 10\,i + 7.5\,j$

$CD = \sqrt{10^2 + 7.5^2} = 12.5$

$\vec{\lambda} = \frac{10}{12.5} i + \frac{7.5}{12.5} j$

$F_{CD} = -45 \text{ kips}$

$\Sigma M_G = 0$

$\Sigma F_y = 0$

6.45 Determine the force in members *BD* and *CD* of the truss shown.

6.46 Determine the force in members *DF* and *DG* of the truss shown.

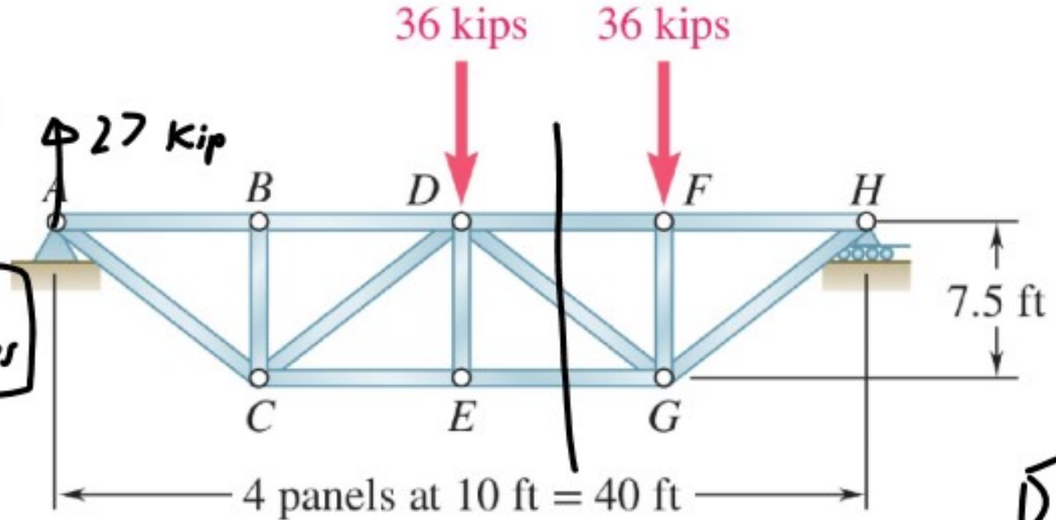


Fig. P6.45 and P6.46

$\Sigma M_G = -30 \cdot 27 + 10 \cdot 36 - 7.5 F_{DF}$

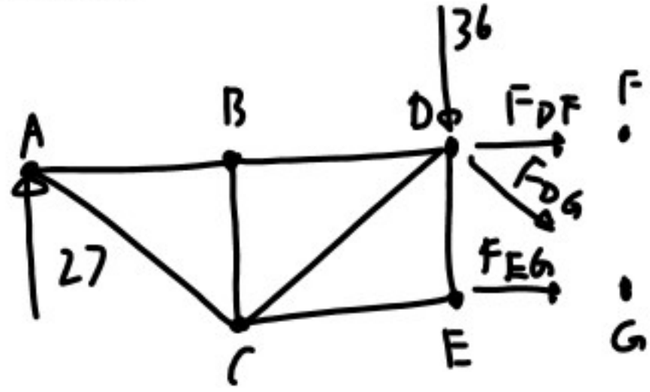
$7.5 F_{DF} = 10 \cdot 36 - 30 \cdot 27$

$F_{DF} = \frac{10 \cdot 36 - 30 \cdot 27}{7.5} = -60 \text{ kips}$

$\Sigma F_y = 27 - 36 - F_{DGy} = 0$

$F_{DGy} = 27 - 36 = -9$

$F_{DG} = \frac{F_{DGy}}{\lambda_y} = \frac{-9}{-7.5/12.5} = 15 \text{ kips}$



$\overrightarrow{DG} = 10i - 7.5j$

$DG = 12.5$

$\lambda = 12/12.5\, i - 7.5/12.5\, j$

$\Sigma F_y = 27 - 36 - 36 + R_H = 0$

$R_H = 36 + 36 - 27$

$= 45$ kips

6.45 Determine the force in members *BD* and *CD* of the truss shown.

6.46 Determine the force in members *DF* and *DG* of the truss shown.

$\Sigma M_G = 0$

$10.95 + 7.5\,F_{DF} = 0$

$F_{DF} = \frac{-10.95}{7.5} = \boxed{-60}$

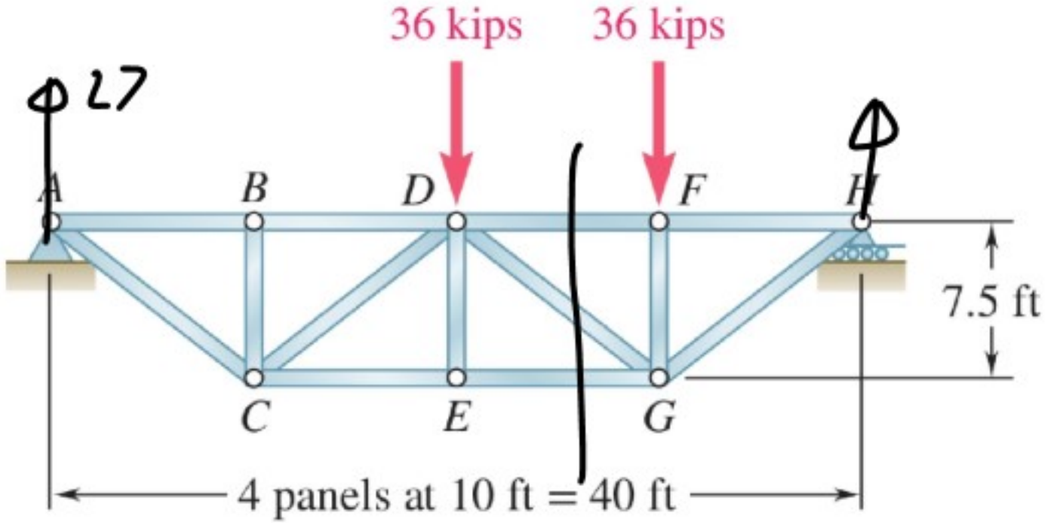
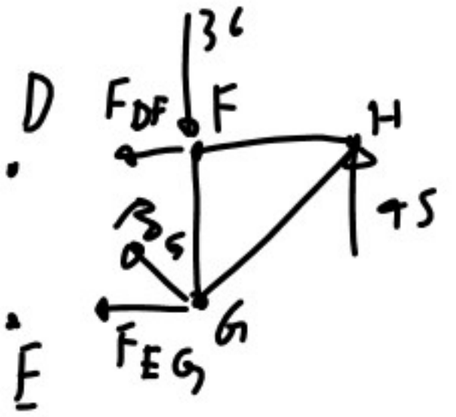


Fig. P6.45 and P6.46



$\Sigma F_y = 0$

$45 - 36 + F_{DGy} = 0$

$F_{DGy} = 36 - 45 = -9$