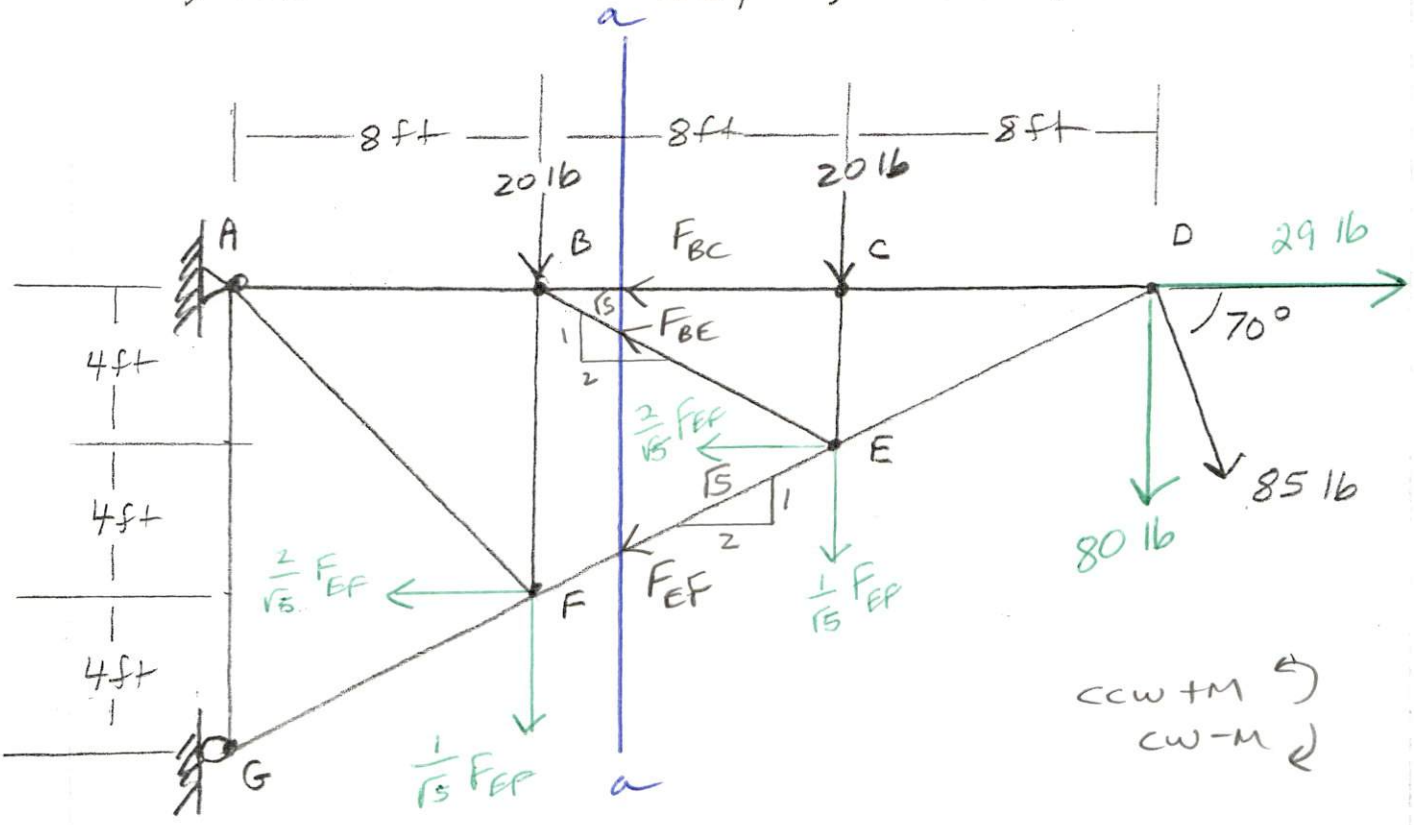
2. using the Method of Sections determine the force in members BC, BE, and EF.



Solution. FBD - Right portion of Section a-a

Equilibrium Equations

$[\Sigma M_B = 0]$

$$-\frac{2}{\sqrt{5}} F_{EF}(8\text{ ft}) - 20\text{ lb}(8\text{ ft}) - 80\text{ lb}(16\text{ ft}) = 0$$

$$-\frac{2}{\sqrt{5}} F_{EF}(8\text{ ft}) = 1440\text{ lb}\cdot\text{ft}$$

$$F_{EF} = -\frac{\frac{\sqrt{5}}{2}(1440\text{ lb}\cdot\text{ft})}{8\text{ ft}}$$

$$= -201\text{ lb (T)}$$

and $\boxed{F_{EF} = 201\text{ lb (C)}}$

$[\Sigma M_E = 0]$

$$F_{BC}(4\,ft) - 801b(8\,ft) - 291b(4\,ft) = 0$$

$$F_{BC} = \frac{756\ lb \cdot ft}{4\,ft} = \underline{189\ lb\ (T)}$$

$[\Sigma F_y = 0]$

$$-201b - 801b - \frac{1}{\sqrt{5}} F_{EF} + \frac{1}{\sqrt{5}} F_{BE} = 0$$

$$\frac{1}{\sqrt{5}} F_{BE} = 201b + 801b + \frac{1}{\sqrt{5}}(-201\,lb)$$

$$F_{BE} = 10(\sqrt{5})\ lb$$

$$F_{BE} = \underline{23\ lb\ (T)}$$

$[\Sigma F_x = 0]$

$$-F_{BC} + 291b - \frac{2}{\sqrt{5}} F_{BE} - \frac{2}{\sqrt{5}} F_{EF} = 0$$

$$-189\,lb + 291b - \frac{2}{\sqrt{5}} F_{BE} - \frac{2}{\sqrt{5}}(-201\,lb) = 0$$

$$-1601b + 1801b - \frac{2}{\sqrt{5}} F_{BE} = 0$$

$$F_{BE} = \sqrt{5}\left(\frac{2011b}{2}\right) = \underline{23\ lb\ (T)}$$