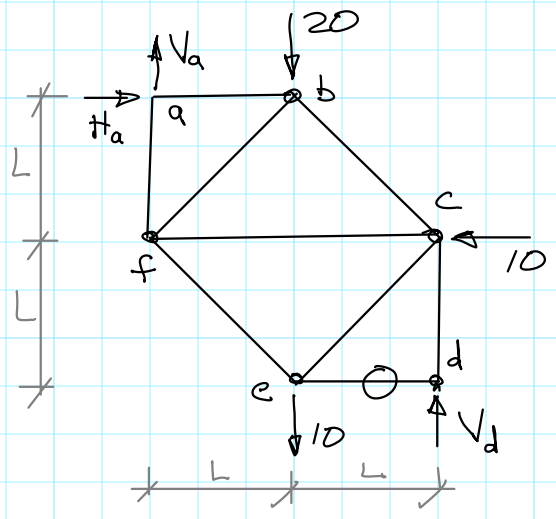
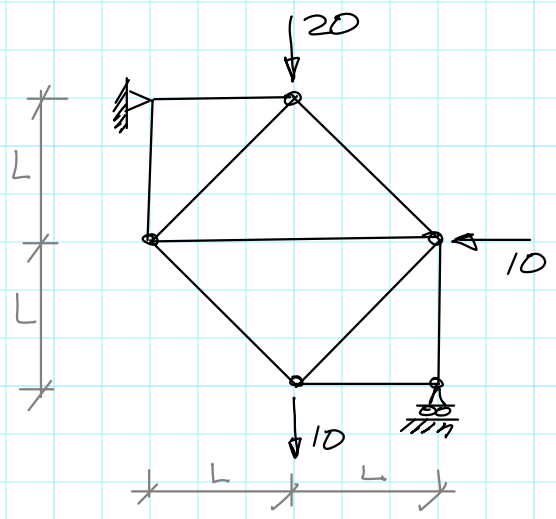


# Example T-1



ed is a force

## Reactions:

$$\sum M_a = 0 \quad (+)$$

$$-20L - 10L - 10L + V_d \times 2L = 0$$

$$V_d = 20 \quad (:\uparrow)$$

$$\sum F_x = 0 \quad (+)$$

$$H_a = 10 \quad (:\rightarrow) \text{ by inspection}$$

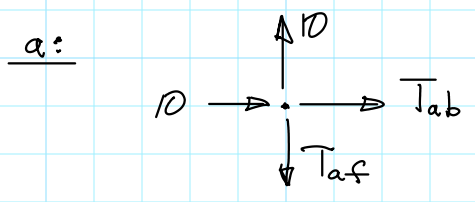
$$\sum F_y = 0 \quad (+)$$

$$V_a - 20 - 10 + V_d = 0$$

$$V_a - 30 + 20 = 0$$

$$V_a = 10 \quad (:\uparrow)$$

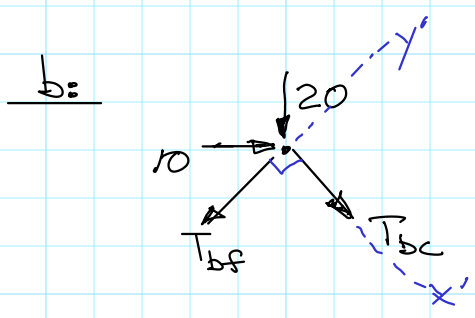
## Method of Joints



by inspection:

$$\frac{T_{ab}}{T_{af}} = -10 \quad (:\text{C})$$

$$\frac{T_{ab}}{T_{af}} = 10 \quad (:\text{T})$$



$$\sum F_{x'} = 0 \quad (+)$$

$$\frac{20}{\sqrt{2}} + \frac{10}{\sqrt{2}} + T_{bc} = 0$$

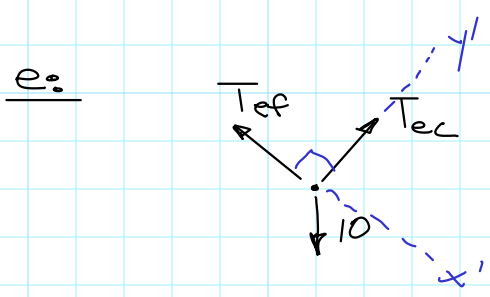
$$T_{bc} = -\frac{30}{\sqrt{2}} \quad (:\text{C})$$

$$\sum F_{y'} = 0 \quad (+)$$

$$-\frac{20}{\sqrt{2}} + \frac{10}{\sqrt{2}} - T_{bf} = 0$$

$$T_{bf} = -\frac{10}{\sqrt{2}} \quad (:\text{C})$$

d:  $T_{cd} = -20$  (∴ c) by inspection

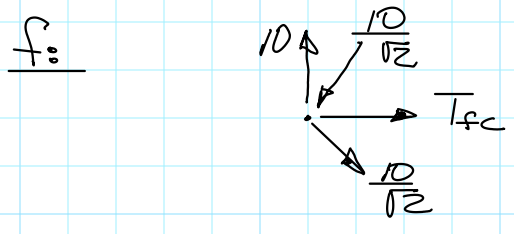


$$\sum F_x' = 0$$

$$\underline{T_{ef} = \frac{10}{\sqrt{2}} \quad (\therefore T)}$$

$$\sum F_y' = 0$$

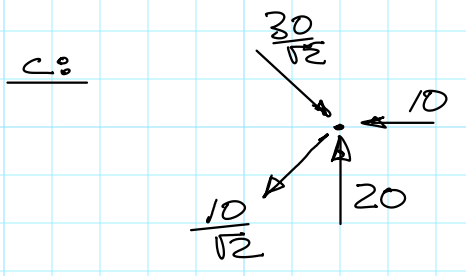
$$\underline{T_{ec} = \frac{10}{\sqrt{2}} \quad (\therefore T)}$$



check  $\sum F_y = 10 - \frac{10}{\sqrt{2}} - \frac{10}{\sqrt{2}} = 0$  OK.

$$\sum F_x = 0$$

$$\underline{T_{fc} = 0}$$



checks:

$$\sum F_x = -10 + \frac{30}{\sqrt{2}} - \frac{10}{\sqrt{2}} = 0 \quad \text{OK.}$$

$$\sum F_y = 20 - \frac{30}{\sqrt{2}} - \frac{10}{\sqrt{2}} = 0 \quad \text{OK.}$$

Summary

(note:  $\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$ )

