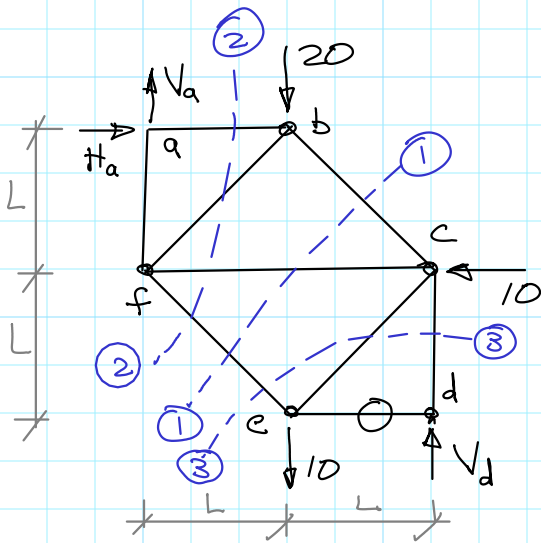


Example T-2

(see example T-1)



ed is 0-force

Reactions:

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

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

$$\underline{V_d = 20} \quad (\therefore \uparrow)$$

$$\sum F_x = 0 \quad \rightarrow$$

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

$$\sum F_y = 0 \quad \uparrow$$

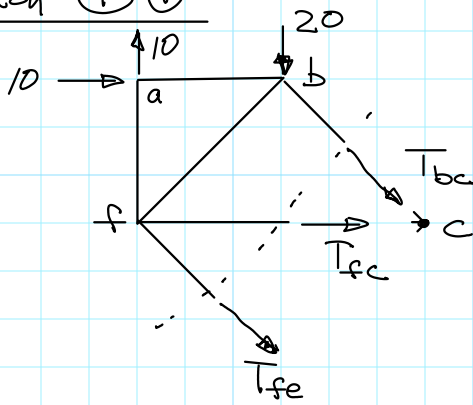
$$V_a - 20 - 10 + V_d = 0$$

$$V_a - 30 + 20 = 0$$

$$\underline{V_a = 10} \quad (\therefore \uparrow)$$

Method of Sections

Section ①-①



Use eqns that involve one unknown:

$$\sum M_c = 0 \quad (+\curvearrowright)$$

$$-10 \times L - 10 \times 2L + 20 \times L + T_{fe} \sqrt{2}L = 0$$

$$\underline{T_{fe} = \frac{10}{\sqrt{2}} = 5\sqrt{2}} \quad (\therefore T)$$

$$\sum M_d = 0 \quad (+\curvearrowright)$$

$$-10 \times L - 20 \times L - T_{bc} \sqrt{2}L = 0$$

$$\underline{T_{bc} = \frac{-30}{\sqrt{2}} = -15\sqrt{2}} \quad (\therefore C)$$

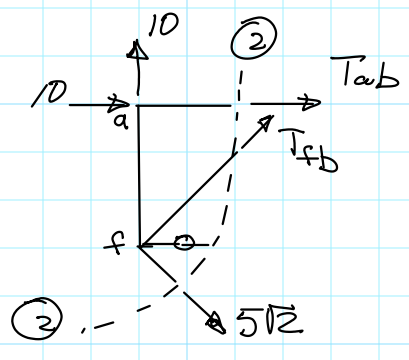
$$\sum F_x = 0 \quad \rightarrow$$

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

$$10 - 15 + 5 + T_{fc} = 0$$

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

Section ②-②



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

$$-10 \times L - T_{ab} \times L = 0$$

$$\underline{T_{ab} = -10 \quad (\therefore c)}$$

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

$$10 + T_{ab} + \frac{T_{fb}}{\sqrt{2}} + \frac{5\sqrt{2}}{\sqrt{2}} = 0$$

$$10 + -10 + \frac{T_{fb}}{\sqrt{2}} + 5 = 0$$

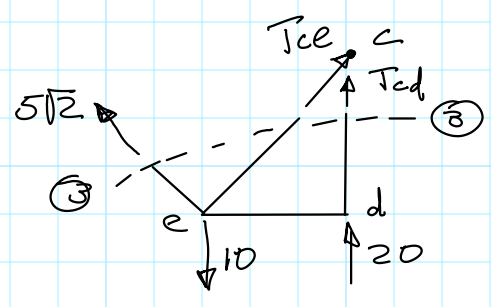
$$\underline{T_{fb} = -5\sqrt{2} \quad (\therefore c)}$$

check:

$$\sum F_y = 10 + \frac{T_{fb}}{\sqrt{2}} - \frac{5\sqrt{2}}{\sqrt{2}}$$

$$= 10 - 5 - 5 = 0 \quad \text{O.K.}$$

Section ③-③



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

$$T_{cd}(L) + 20(L) = 0$$

$$\underline{T_{cd} = -20 \quad (\therefore c)}$$

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

$$-\frac{5\sqrt{2}}{\sqrt{2}} + \frac{T_{ce}}{\sqrt{2}} = 0$$

$$\underline{T_{ce} = 5\sqrt{2} \quad (\therefore T)}$$

Note: for many trusses it is convenient to use a combination of methods.

check:

$$\sum F_y = \frac{5\sqrt{2}}{\sqrt{2}} + \frac{T_{ce}}{\sqrt{2}} + T_{cd} - 10 + 20$$

$$= 5 + 5 - 20 - 10 + 20$$

$$= 0 \quad \text{O.K.}$$

Summary: as for T-1: