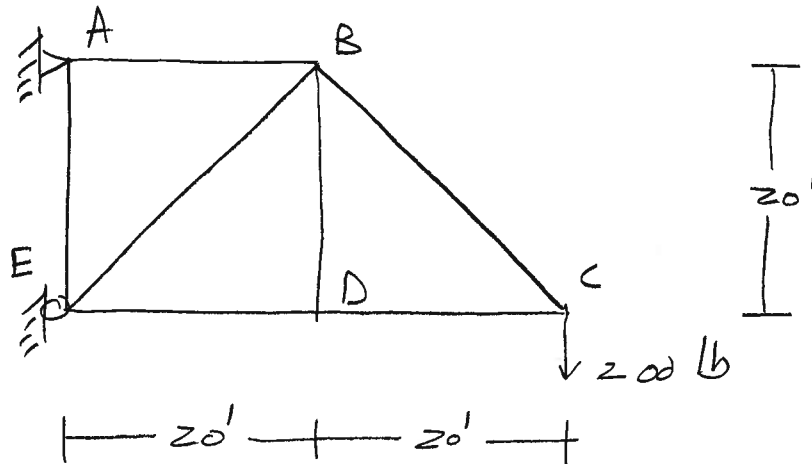
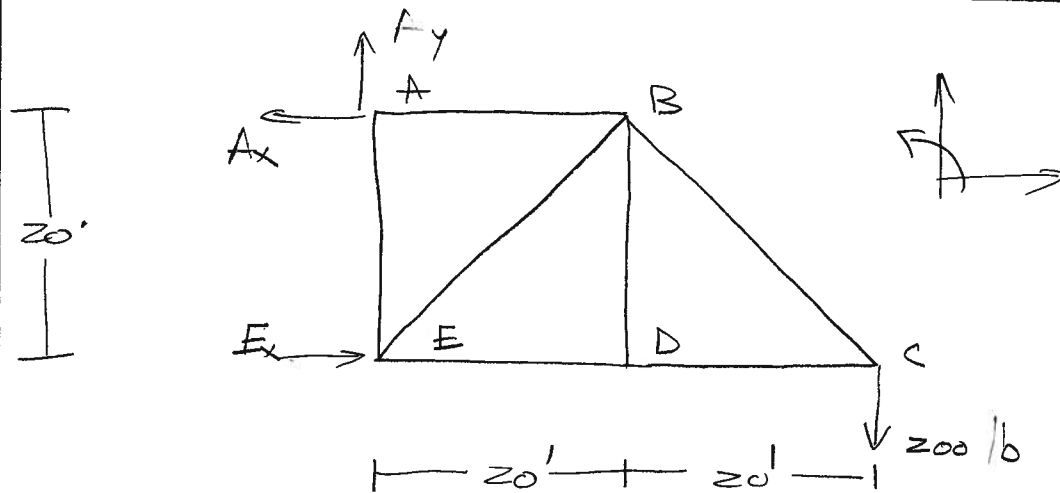


Use the "intuitive" method of joints to calculate the force in each member of the truss shown.



Draw F.B.D. of total truss



$$\sum M_A = 0$$

$$(1) \quad + E_x (20) - 200(40) = 0$$

$$(2) \quad \underline{E_x = 400 \text{ lb}} \rightarrow \text{as shown}$$

(3) $\overset{+}{\rightarrow} \sum F_x = 0$
 $-A_x + \cancel{F_x} = 0$

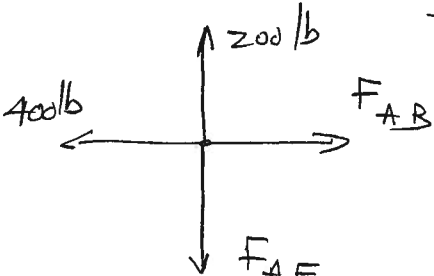
(4) $A_x = 400 \text{ lb} \leftarrow$ as shown

(5) $\overset{+}{\uparrow} \sum F_y = 0$
 $A_y - 200 = 0$

(6) $A_y = 200 \text{ lb} \uparrow$ as shown

Start with joint A because it only has 2 unknowns

(7) $\overset{+}{\rightarrow} \sum F_x = 0$
 $-400 + F_{AB} = 0$
 $F_{AB} = 400 \text{ lb T}$

(8) 

(9) $\sum F_y = 0$
 $200 - F_{AE} = 0$
 $F_{AE} = 200 \text{ lb T}$

(10)

Move to joint E because it now only has 2 unknowns

(17)

(18)

$$+\uparrow \sum F_y = 0 \quad 200$$

$$F_{AE} + .707 F_{EB} = 0$$

(19)

$$F_{EB} = -282.9 \text{ lb}$$

or

282.9 lb C

(20)

$$+\rightarrow \sum F_x = 0 \quad -282.9$$

$$400 + F_{ED} + .707 F_{EB} = 0$$

(21)

Move to joint D because it now has only 2 unknowns

(22)

$$+\rightarrow \sum F_x = 0$$

$$-F_{ED} + F_{DC} = 0$$

(23)

$$F_{DC} = -200 \text{ lb}$$

or

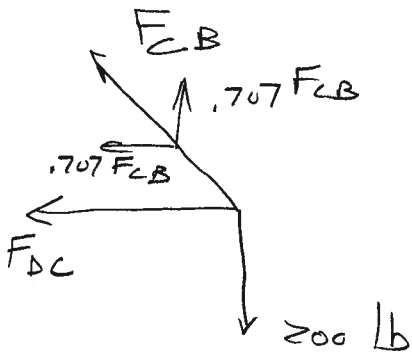
200 lb C

(24)

$$+\uparrow \sum F_y = 0$$

$$F_{DB} = 0$$

Move to joint C to calculate the last unknown

(11) 

(12)
$$+\uparrow \sum F_y = 0$$

$$.707 F_{CB} - 200 = 0$$

$$F_{CB} = 282.9 \text{ lb T}$$

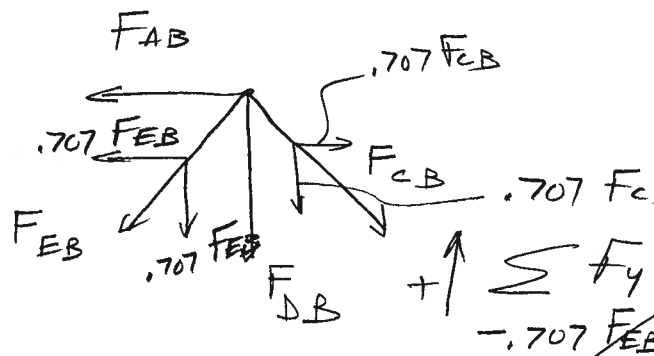
check

(13)
$$+\rightarrow \sum F_x = 0$$

$$-200 + 282.9 - F_{DC} - .707 F_{CB} = 0$$

(14)
$$0 = 0 \quad \text{OK}$$

Move to joint B to finish check

(15) 

(16)
$$+\uparrow \sum F_y = 0$$

$$-200 + .707 F_{AB} - F_{DB} - .707 F_{CB} = 0$$

$$0 = 0 \quad \text{OK}$$

(23) $\sum F_x = 0$

$$-F_{AB} - .707 F_{EB} + .707 F_{CB} = 0$$

$0 = 0 \quad \text{OK}$

