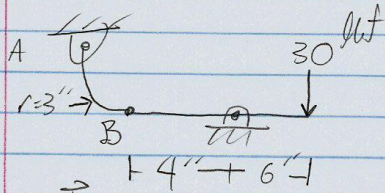
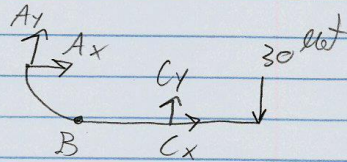


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FBD ABC:



$$\begin{aligned} \sum \vec{F}_x = 0 &= A_x + C_x \\ \sum \vec{F}_y = 0 &= A_y + C_y - 30 \end{aligned} \quad \left. \vphantom{\begin{aligned} \sum \vec{F}_x = 0 \\ \sum \vec{F}_y = 0 \end{aligned}} \right\} \text{Statically Indeterminate}$$

BC:

$$\begin{aligned} \sum \vec{F}_x = 0 &= B_x + C_x \\ \sum \vec{F}_y = 0 &= B_y + C_y - 30 \\ \sum M_C = 0 &= 4C_y - 10 \cdot 30 \end{aligned}$$

$C_y = 75 \text{ lb}$, $B_y = -45$

AB:

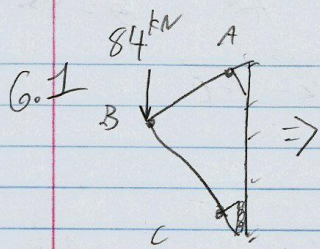
$$\begin{aligned} A_y = B_y &= -45 \text{ lb} \\ A_x = B_x & \end{aligned}$$

$\sum \vec{F}_y$
 $\sum \vec{F}_x$

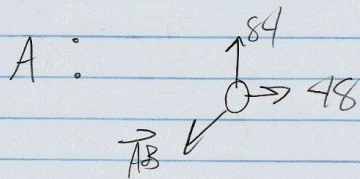
Total:

$$\sum M_C = 0 = -6 \cdot 30 - 3A_x + 7 \cdot 45$$

$$\begin{aligned} A_x &= 45 \text{ lb} \\ C_x &= -45 \text{ lb} \end{aligned}$$

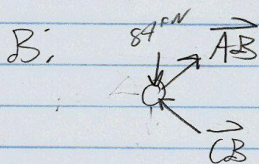


$$\begin{aligned} \sum \vec{F}_x = 0 &= A_x - C_x \\ \sum \vec{F}_y = 0 &= A_y - 84 \text{ kN} \\ A_y &= 84 \text{ kN} \\ \sum M_A = 0 &= 3 \cdot 84 \text{ kN} - 5.25 C_x \\ C_x &= 48 \text{ kN}; A_x = 48 \text{ kN} \end{aligned}$$



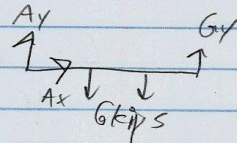
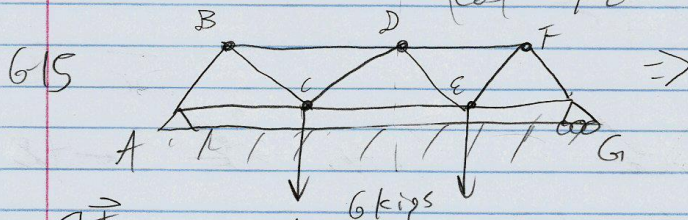
\vec{AB} is in compression

$$\begin{aligned} \vec{AB} &= \langle -48, -84, 0 \rangle \text{ kN} \\ |\vec{AB}| &= 96.75 \end{aligned}$$

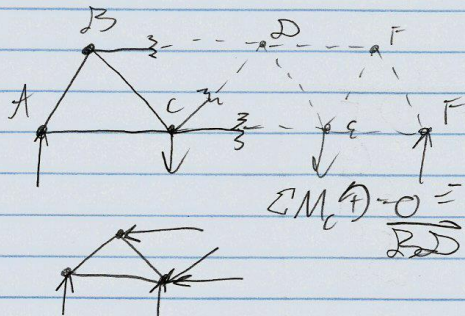


\vec{CB} is in tension

$$\begin{aligned} \vec{CB} &= \langle 48, 0, 0 \rangle \text{ kN} \\ |\vec{CB}| &= 48 \text{ kN} \end{aligned}$$



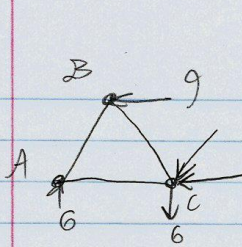
$$\begin{aligned} \sum \vec{F}_x = 0 &= A_x \\ \sum \vec{F}_y = 0 &= A_y + G_y - 12 \text{ kips} \\ \sum M_A = 0 &= -18 \cdot 6 \text{ kips} - 36 \cdot 6 \text{ kips} + 54 G_y \\ G_y &= 6 \text{ kips}; A_y = 6 \text{ kips} \end{aligned}$$



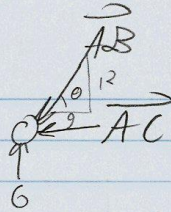
Symmetric \therefore solve for let t

$$\begin{aligned} \sum M_C = 0 &= 18 \cdot 6 \text{ kips} + 12 \cdot \vec{BD} \\ \vec{BD} &= 9 \text{ kips} \end{aligned}$$

Units: kips, ft



A:



$\theta = 53.13^\circ$

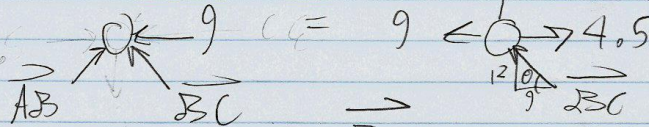
$$\vec{AB} = \langle -.6 AB, -.8 AB, 0 \rangle$$

$$\sum \vec{F}_y = 0 = 6 - AB_y \quad ; \quad AB_y = 6 = .8 AB$$

$$AB = 7.5 \text{ kips}$$

$$\sum \vec{F}_x = 0 = -.6 AB + AC \quad ; \quad AC = \langle 4.5, 0, 0 \rangle \text{ kips}$$

B:



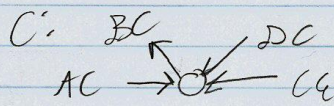
$\theta = 53.13^\circ$

$$\vec{BC} = \langle -.6 BC, .8 BC, 0 \rangle$$

$$\sum \vec{F}_x = 0 = -9 + 4.5 - .6 BC$$

$$BC = -7.5 \text{ kips}$$

$$\vec{BC} = \langle 4.5, -6, 0 \rangle$$



$\theta = 53.13^\circ$

$$\vec{DC} = \langle -.6 DC, .8 DC, 0 \rangle$$

CE in x only

$$\sum \vec{F}_x = 0 = -CE - .6 DC$$

$$\sum \vec{F}_y = 0 = 6 - .8 DC$$

$$DC = 7.5 \text{ kips}$$

$$CE = -4.5$$

Units:	BD = 9	T	=	DF
kips	AB = 7.5	T	=	FG
	AC = 4.5	T	=	EG
	BC = 7.5	C	=	FE
	DC = 7.5	T	=	DE
	CE = 4.5	C		