

Quiz

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1181136

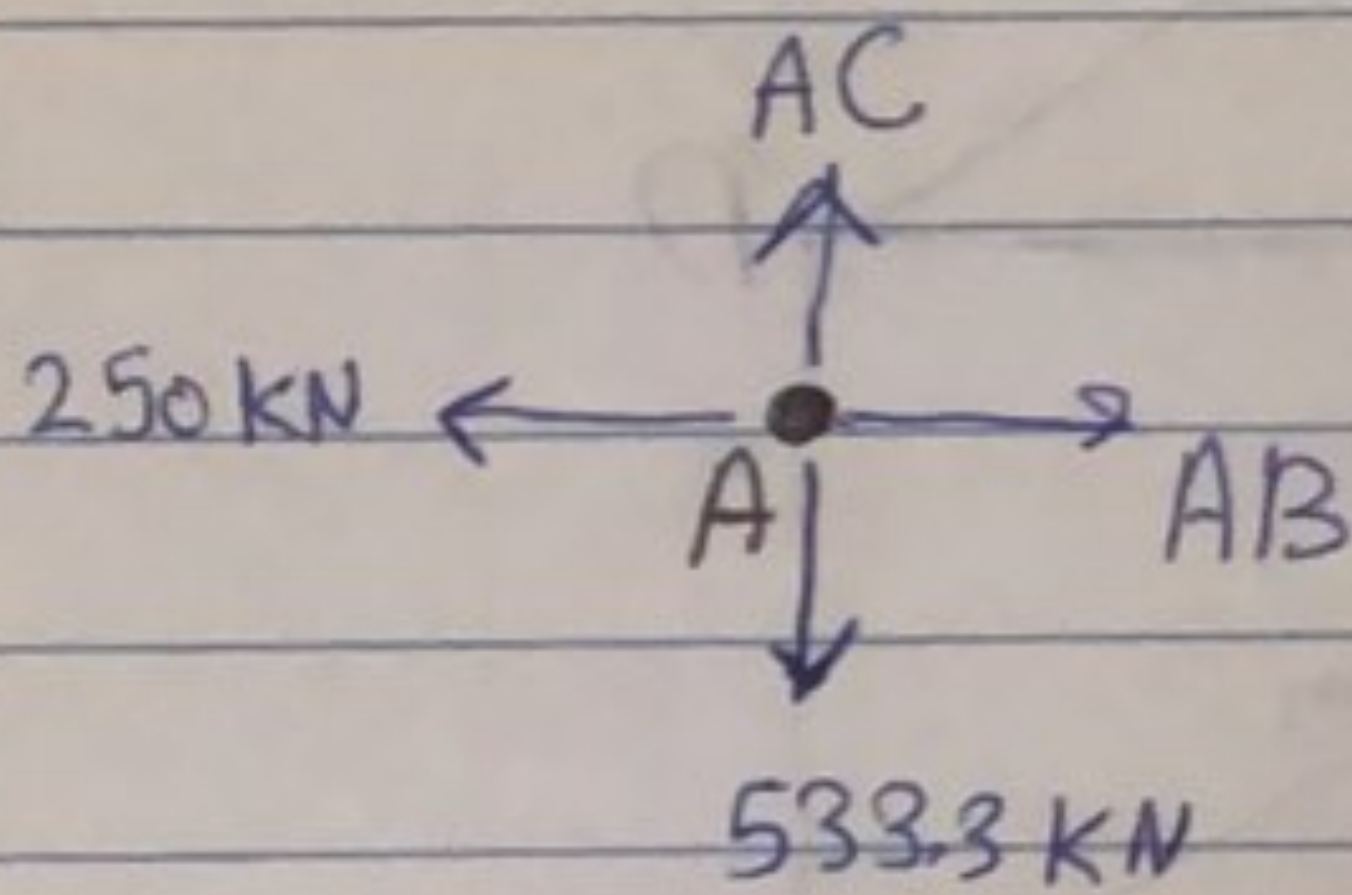
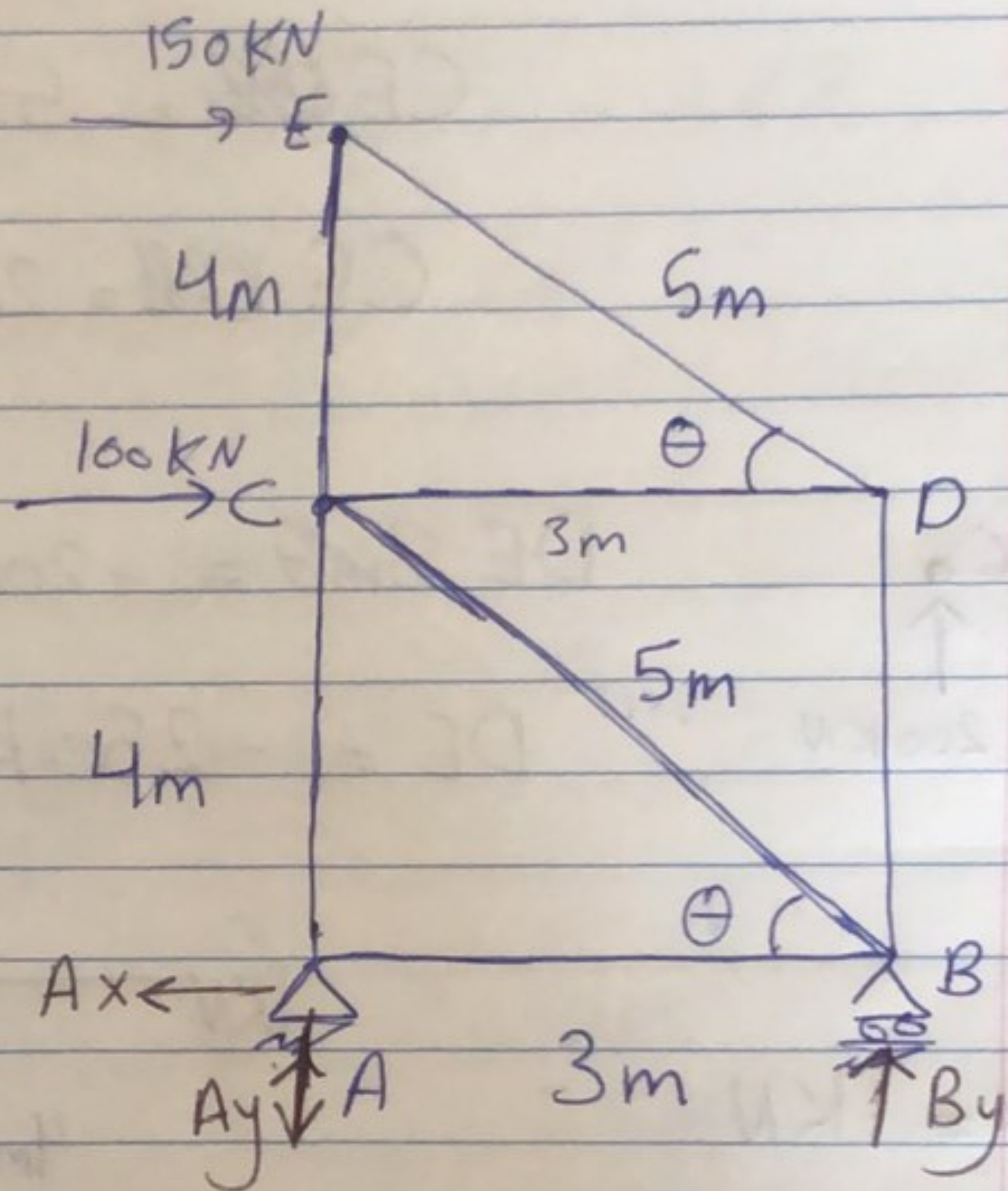
$$\sum F_x = 0: A_x = 250 \text{ kN}$$

$$\sum M_B = 0:$$

$$3A_y = 400 + 1200$$

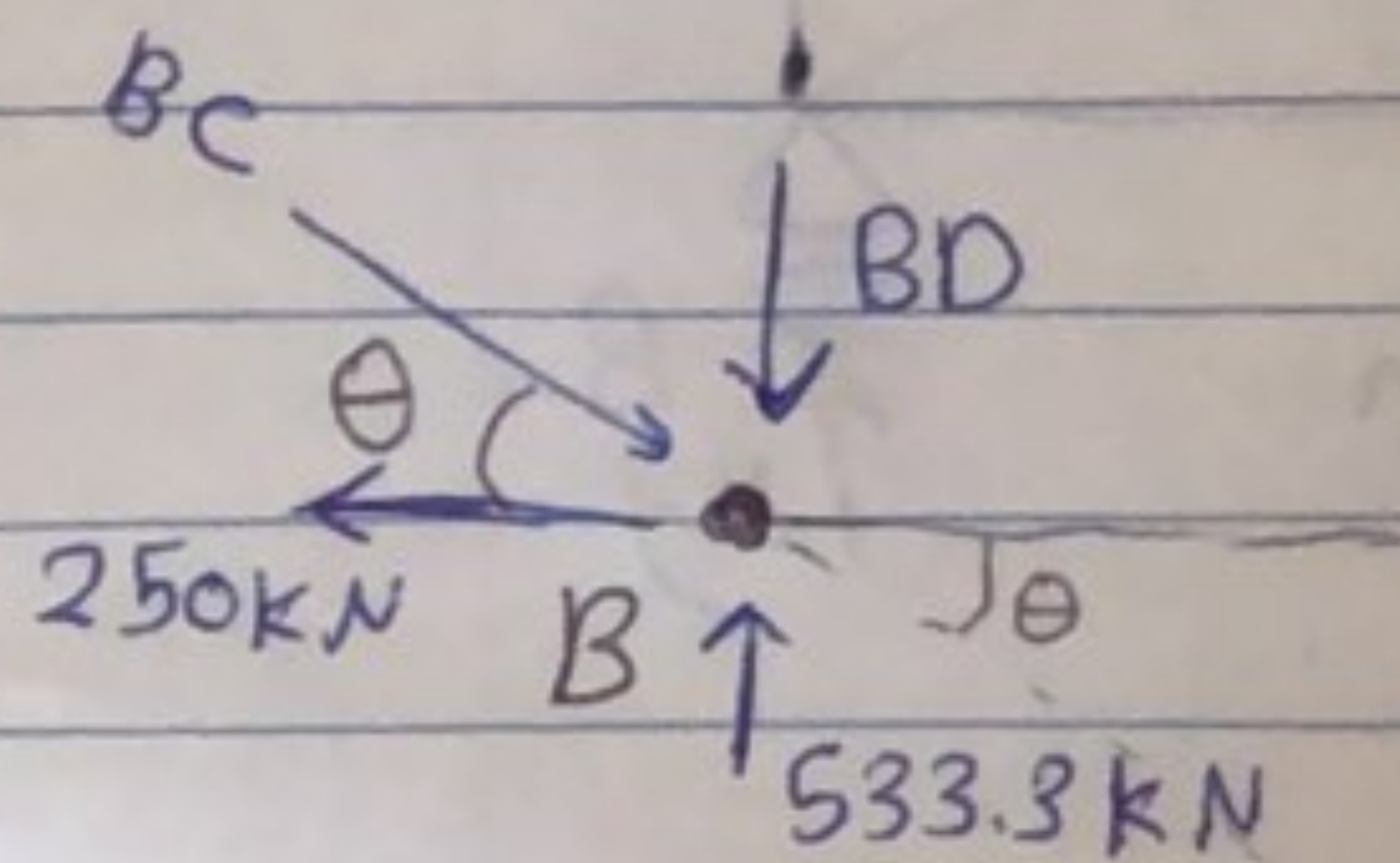
$$A_y = 533.3 \text{ kN} \downarrow$$

$$\sum F_y = 0: C_y = 533.3 \text{ kN} \uparrow$$



$$AC = 533.3 \text{ kN "T"}$$

$$AB = 250 \text{ kN "T"}$$

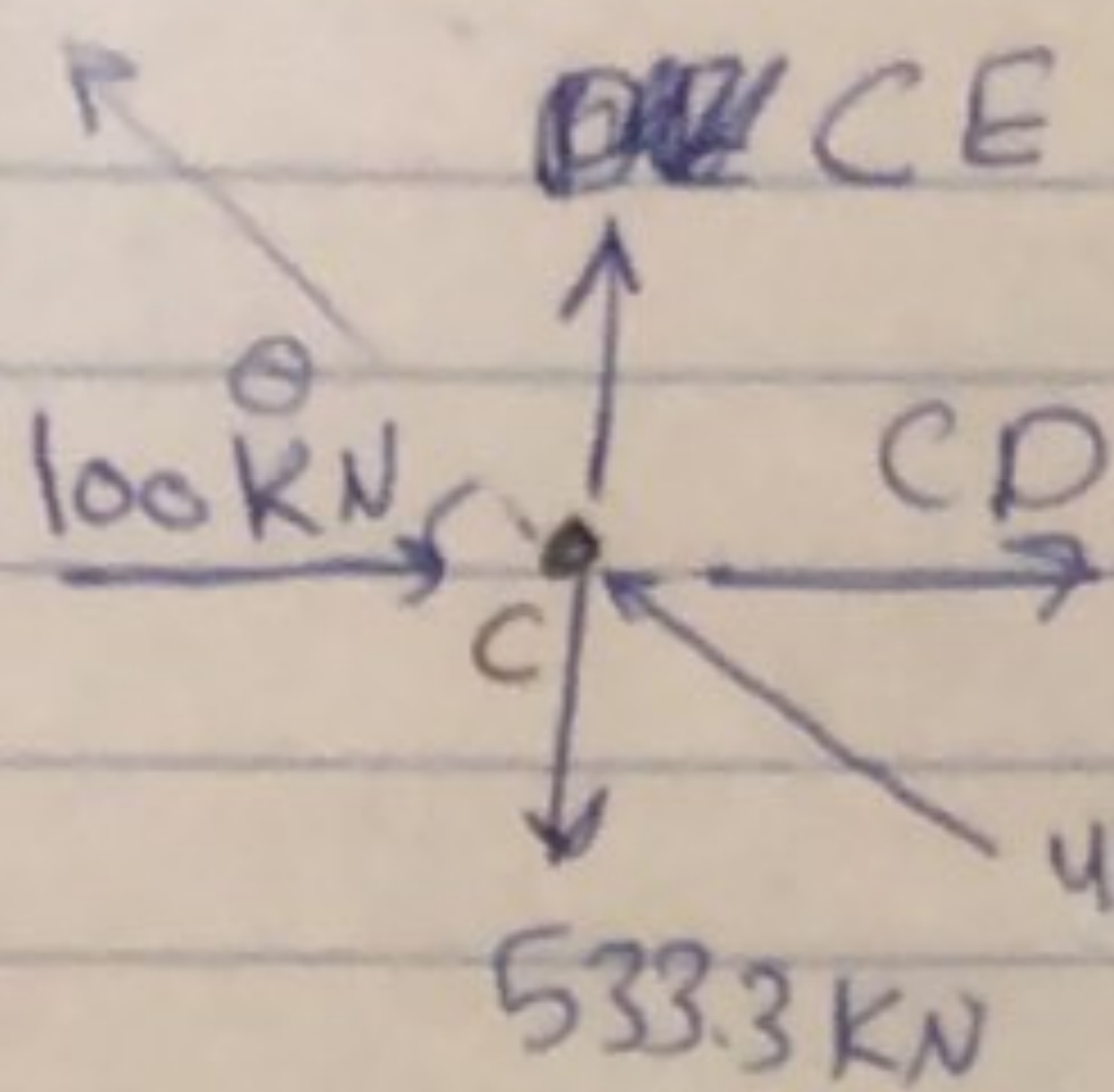


$$BC \cos \theta = 250$$

$$BC = 416.67 \text{ kN "C"}$$

$$BD + BC \sin \theta = 533.3$$

$$BD = 200 \text{ kN "C"}$$

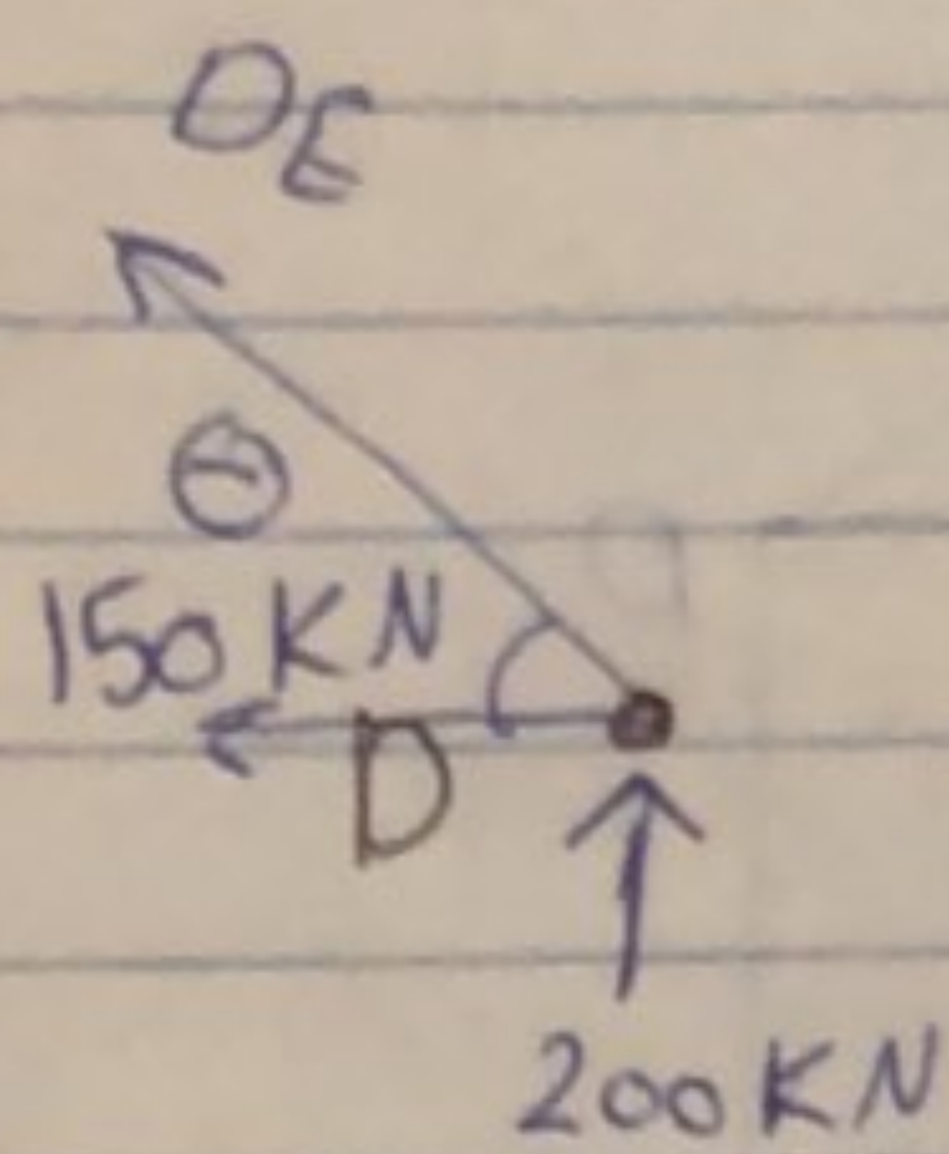


$$CD + 100 = 416.67 \cos \theta$$

$$CD = 150 \text{ kN "T"}$$

$$CE = 533.33 - 416.67 \sin \theta$$

$$CE = 200 \text{ kN "T"}$$



$$DE \sin \theta = -200$$

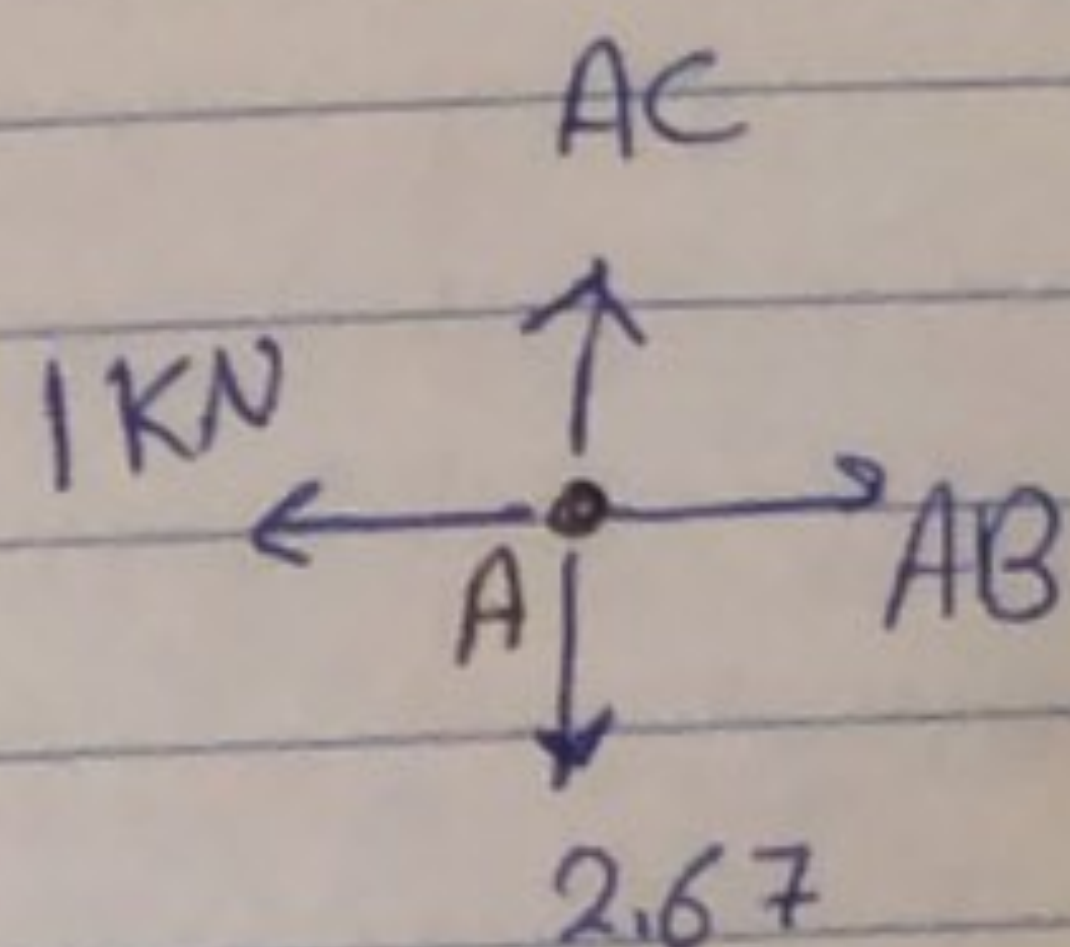
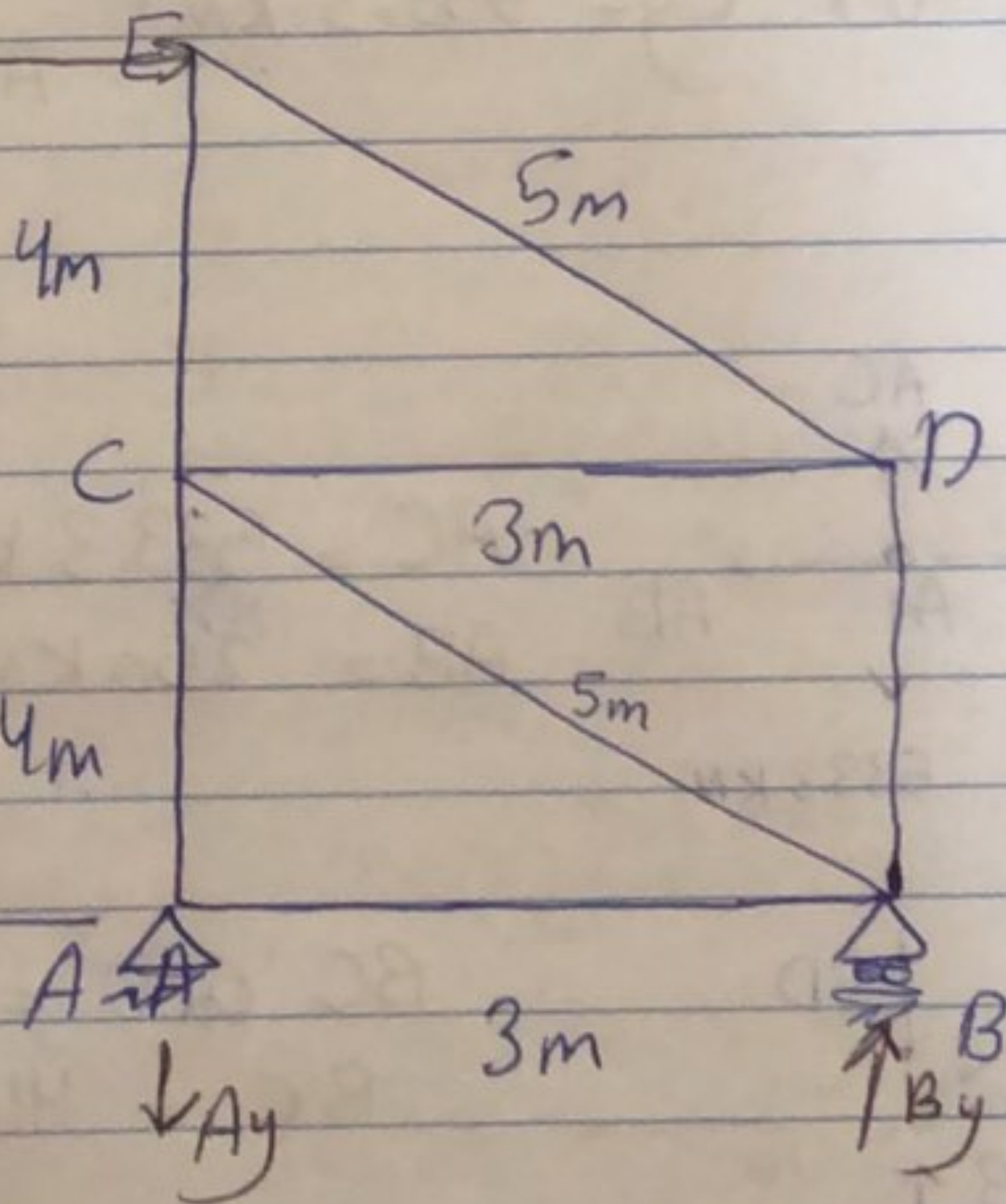
$$DE = -250 \text{ kN} = 250 \text{ kN "C"}$$

$$A_x = 1 \text{ kN}$$

$$\sum M_B = 0 : 3A_y = 8$$

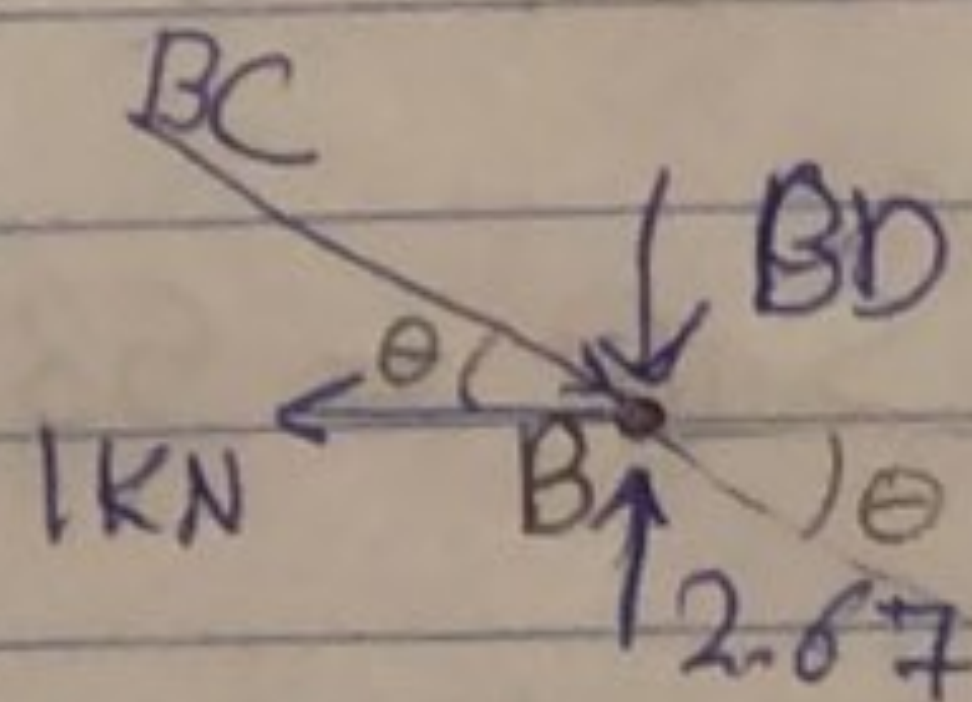
$$A_y = 2.67 \text{ kN } \downarrow$$

$$C_y = 2.67 \text{ kN } \uparrow$$



$$AC = 2.67 \text{ kN "T"}$$

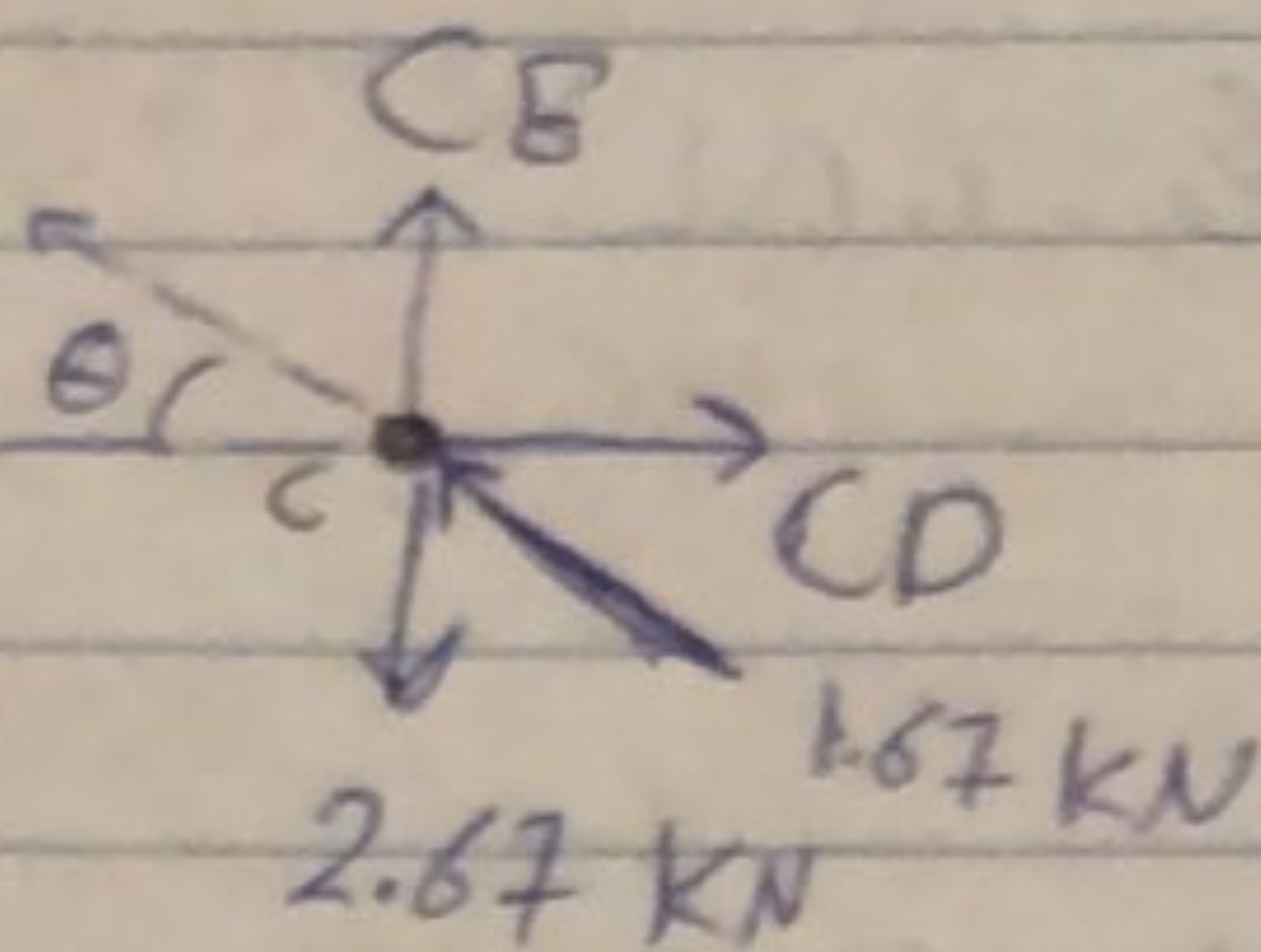
$$AB = 1 \text{ kN "T"}$$



$$BC \cos \theta = 1$$

$$BC = 1.67 \text{ kN "C"}$$

$$BD + BC \sin \theta = 2.67 \rightarrow BD = 1.34 \text{ kN "C"}$$

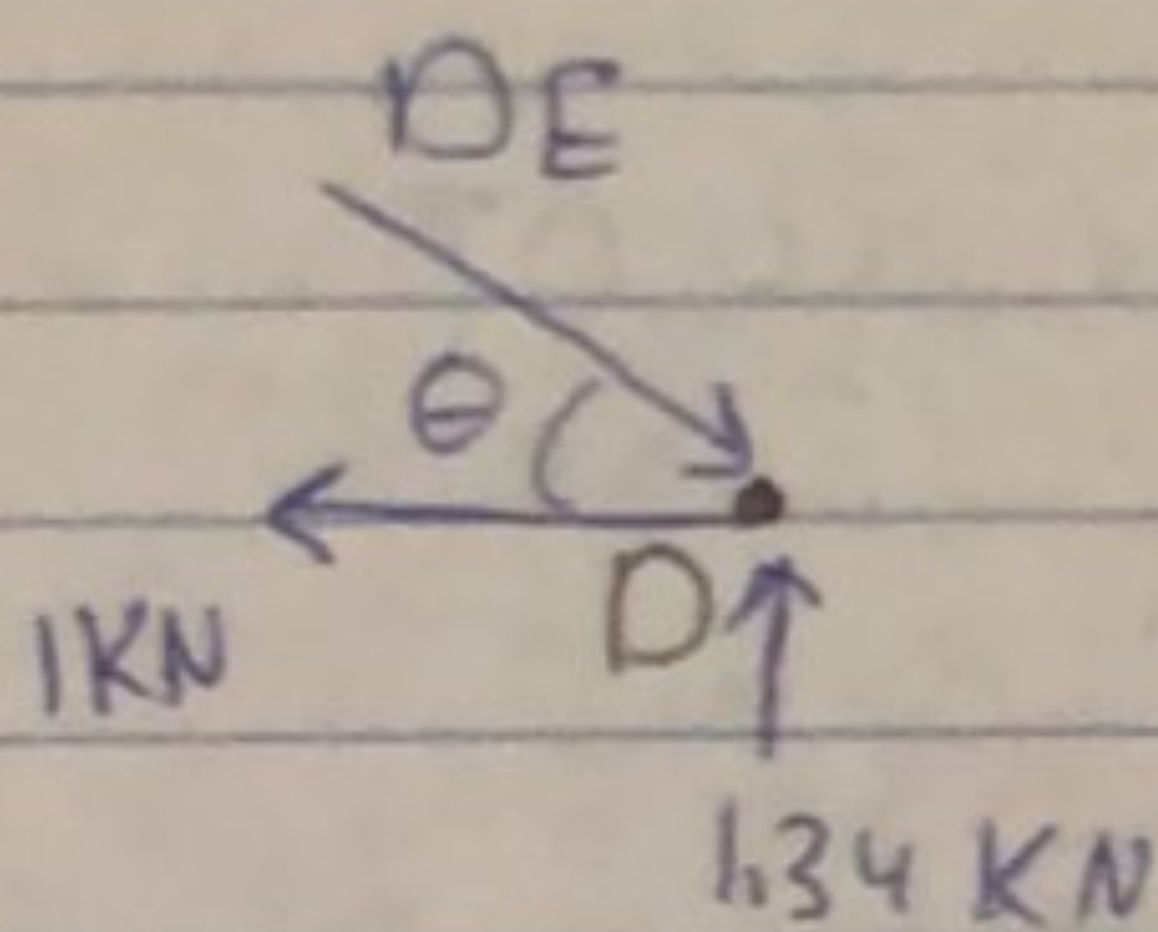


$$CD = 1.67 \cos \theta$$

$$CD = 1 \text{ kN "T"}$$

$$CE + 1.67 \sin \theta = 2.67$$

$$CE = 1.34 \text{ kN "T"}$$



$$DE \sin \theta = 1.34$$

$$DE = 1.67 \text{ kN "C"}$$

	n	N	L	nNL
AB	1	250	3	750
BD	-1.34	-200	4	1072
AC	2.67	533.3	4	5695.644
BC	-1.67	-416.67	5	3479.1945
CD	1	150	3	450
CE	1.34	200	4	1072
DE	-1.67	-250	5	2087.5

$$\Sigma nNL = 14606.34$$

~~XXXXXXXXXX~~

	n	ΔL	$n \Delta L$
AC	2.67	-0.05	-0.1335
CE	1.34	-0.05	-0.067

~~$$\sum n \Delta L = -0.2005$$~~

$$\sum n \Delta L = -0.2005$$

~~DB~~

DB	n	α	L	ΔT	$n \alpha L \Delta T$
BD	-1.34	1.2×10^{-5}	4	-30	1.93×10^{-3}
DE	-1.67	1.2×10^{-5}	5	-30	3×10^{-3}

$$\sum n \alpha L \Delta T = 4.93 \times 10^{-3}$$

$$\begin{aligned}
 l * \Delta \epsilon &= \frac{\sum n \Delta L}{AE} + \sum n \alpha L \Delta T + \sum n \Delta L \\
 &= \frac{14606.34}{2000 * 10^6 * 200 * 10^6} + 4.93 * 10^{-3} - 0.2005 \\
 &= 0.0365 + 4.93 * 10^{-3} - 0.2005 \\
 &= -0.159 \text{ m}
 \end{aligned}$$