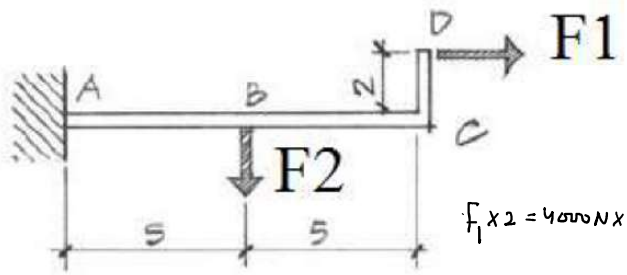
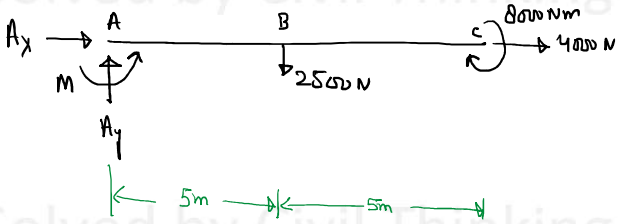
Load, Shear and Moment Diagrams:

2. For a cantilever beam with an upturned end, draw the load, shear, and moment diagrams. F1=4000N, F2=2500N.



$F_1 \times 2 = 4000N \times 2m = 8000Nm$



$\circlearrowleft \Sigma M_A = 0$:

$-8000_{Nm} - (2500N \times 5m) + M = 0$

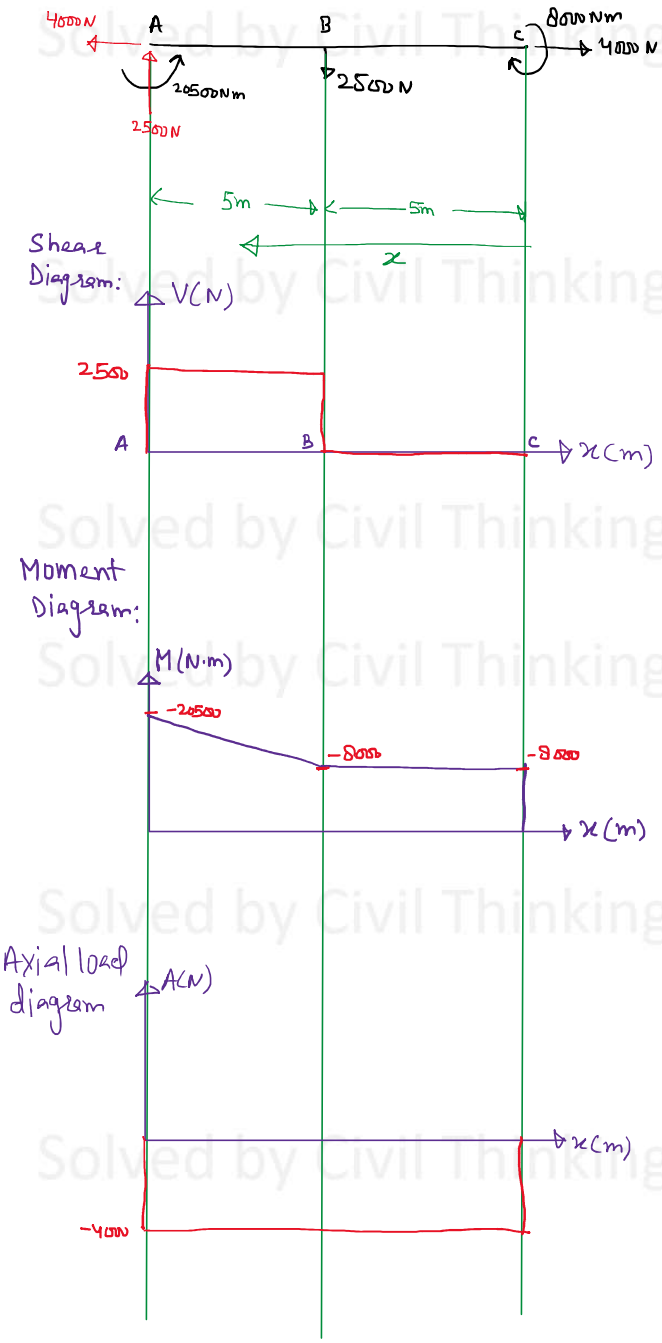
$\Rightarrow M = 8000Nm + 2500 \times 5 N.m = 20500 Nm$

$\uparrow \Sigma F_y = 0$:

$A_y - 2500N = 0 \Rightarrow A_y = 2500N$

$\xrightarrow{+} \Sigma F_x = 0$:

$A_x + 4000N = 0 \Rightarrow A_x = -4000N = 4000N (\leftarrow)$



Shear force, V at different points (+↑):

- $V_A = 2500\ N$
- $V_B = 2500 - 2500 = 0$
- $V_C = 0$

Moment, M at different points (↻+):

- $M_C = -8000\ Nm$
- $M_B = -8000\ Nm$
- $M_{A^+} = -8000\ Nm - (2500\ N \times 5\ m) = -20500\ N\,m$

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