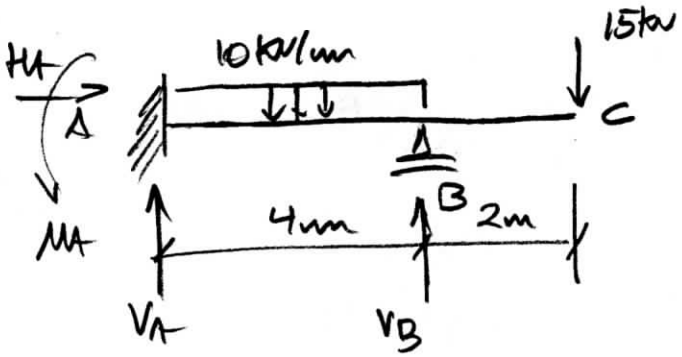
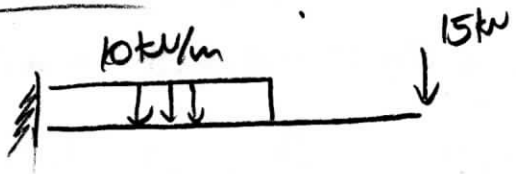
TE2-4.2



Caso 0:



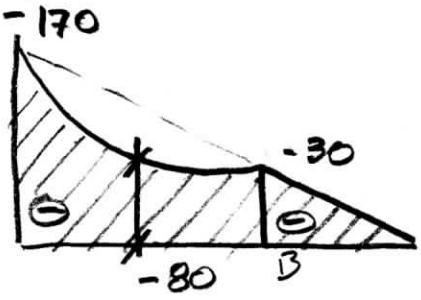
Caso 1:



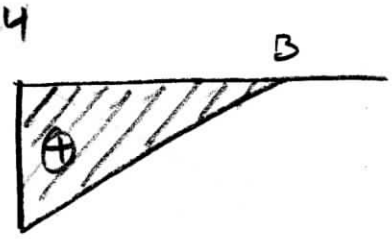
$M_A = \left(15\times 6 + 10\times \frac{4^2}{2}\right) = -170\,kNm$

$M_B = -15\times 2 = -30\,kNm$

M_0



M_1



$\left(\frac{-170-30}{2}\right) + \frac{10\times 4^2}{8} = -80$

$$\delta_{B0} = \frac{1}{EI}\left[\frac{1}{6} L * (2j2 + j3)\right] = \frac{1}{EI}\left[\frac{1}{6} \times 4m \times +4kNm \left(2 - 80kNm - 170kNm\right)\right]$$

$$\delta_{B0} = \frac{-880}{EI}$$

$$\delta_{B1} = \frac{1}{EI}\left[\frac{1}{3} L j k\right] = \frac{1}{EI} \times \frac{1}{3} 4m \times -4kNm \times -4kNm$$

$$\delta_{B1} = \frac{21{,}333}{EI}$$

$$-\delta_{B0} + \delta_{B1} \times V_B = 0$$

$$V_B = \delta_{B0} / \delta_{B1}$$

$$V_B = \frac{880/EI}{21{,}333/EI} = 41{,}25\,kN \uparrow$$

$\uparrow \oplus \quad \Sigma F_V = 0 \qquad V_A + 41{,}25 - 15 - 10 \times 4 = 0$

$$V_A = 40 + 15 - 41{,}25 = 13{,}75\,kN \uparrow$$

$\circlearrowleft \quad \Sigma M_A = 0 \qquad M_A + 41{,}25\,kN \times 4m - 15\,kN \times 6m - 10\,kN/m \times 4m \times 2m = 0$

$\oplus$

$$M_A = -41{,}25 \times 4 + 15 \times 6 + 10 \times 8 = +5\,kNm \circlearrowleft$$