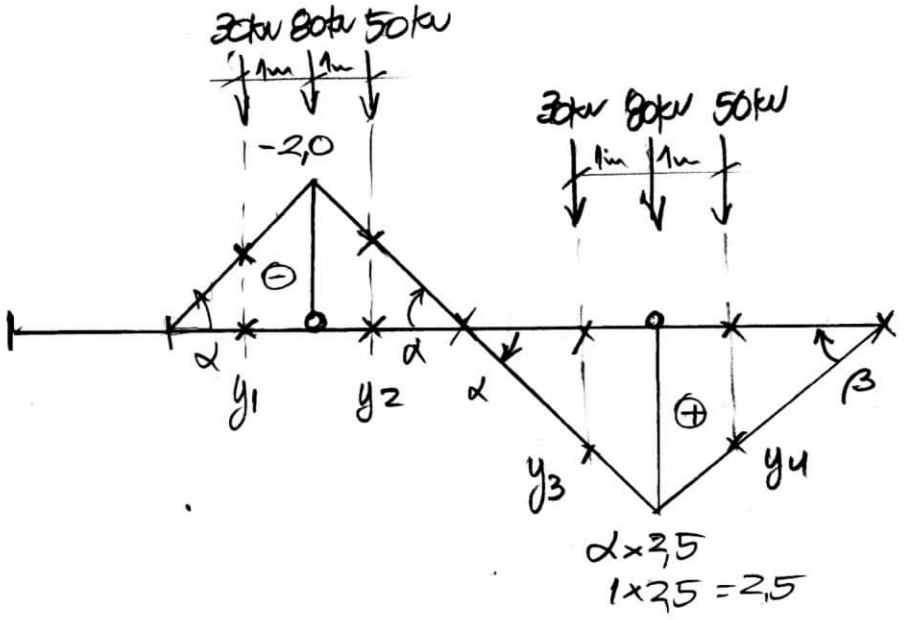
TE2-2.2



LINHA 1

$\alpha = 1$

$\beta = \frac{\Delta V}{\Delta H} = \frac{2,5}{3} = 0,83333$

$A_{\ominus} = (4m \times 2m)/2 = -4m^2$

$A_{\oplus} = (5,5m \times 2,5m)/2 = +6,875m^2$

$y_1 = -1 \quad y_2 = -1$

$y_3 = \alpha \times (2,5-1) = 1 \times 1,5 = 1,5$

$y_4 = \beta \times (3-1) = 0,83333 \times 2 = 1,6667$

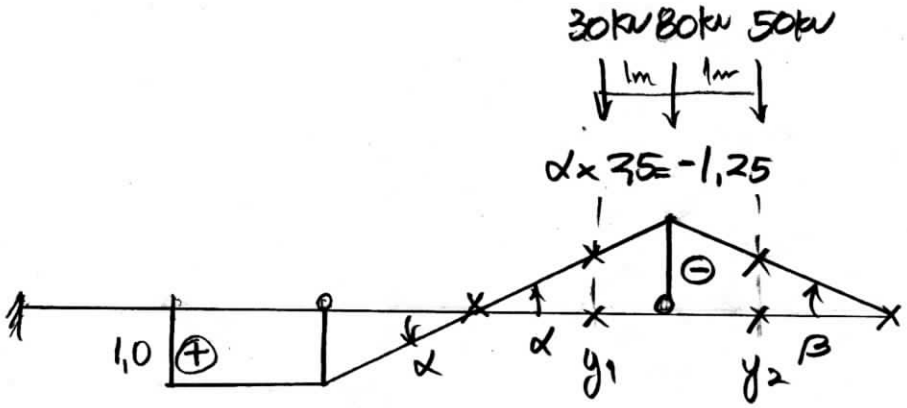
$M_{\oplus\ max\ S1} = \frac{30kN}{m} \times 6,875m^2 + 80kN(2,5m) + 50kN(1,6667m) + 30kN(1,5m)$

$M_{\oplus\ max\ S1} = \boxed{534,6\ kNm}$

$M_{\ominus\ max\ S1} = \frac{30kN}{m} \times -4m^2 + 80kN(-2) + 50kN(-1) + 30kN(-1)$

$M_{\ominus\ max\ S1} = \boxed{-360\ kNm}$

(=)



LIQS1

$$\alpha = \frac{\Delta V}{\Delta H} = \frac{1}{2} = 0{,}5$$

$$\beta = \frac{\Delta V}{\Delta H} = \frac{1{,}25}{3} = 0{,}41667$$

$$y_1 = \alpha \times (2{,}5 - 1) = -0{,}5 \times 1{,}5 = -0{,}75$$

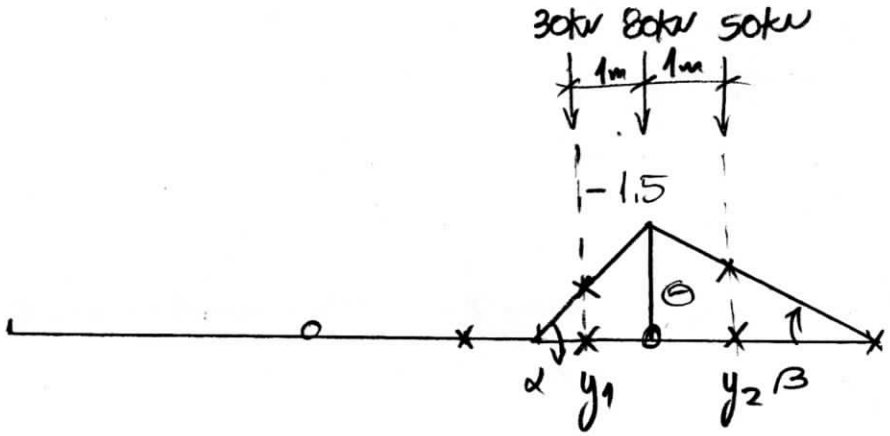
$$y_2 = \beta \times (3 - 1) = -0{,}5 \times 2{,}0 = -1{,}00$$

$$A_{\ominus} = 5{,}5\,m \times -1{,}25/2 = -3{,}4375\,m$$

$$Q\ominus_{MÁX\,S1} = \frac{30kN}{m} \times -3{,}4375m + 80kN(-1{,}25) + 50kN(-1{,}0) + 30kN(-0{,}75)$$

$$\boxed{Q\ominus_{MÁX\,S1} = -275{,}6\,kN}$$

* O CORTANTE POSITIVO MÁXIMO TERÁ VALOR MENOR DO QUE O MÓDULO DO CORTANTE NEGATIVO MÁXIMO



LI M_{S2}

$\alpha = 1$

$\beta = \frac{\Delta V}{\Delta H} = \frac{1,5}{3} = 95$

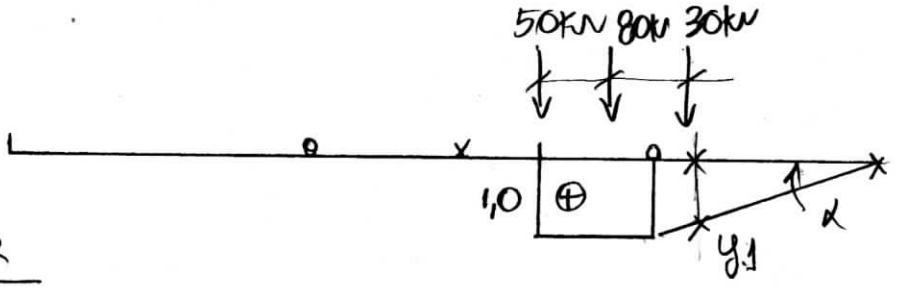
$y_1 = (1,5-1) \times \alpha = 1 \times 0,5 = 0,5$

$y_2 = (3-1) \times \beta = 2 \times 95 = 1,0$

$A\ominus = (4,5m \times 1,5m)/2 = -3,375\ m^2$

$M\ominus_{máx\,S2} = 30kN/m(-3,375m^2) + 80kN(-1,5m) + 50kN(1,0m) + 30kN(-95m)$

$M\ominus_{máx\,S2} = -286,25\ kNm$ // $M\oplus_{máx\,S2} = \phi$ //



LI Q_{S2}

$A\oplus = 1,0 \times 1,5m + (1,0 \times 3m)/2 = +3m$

$\alpha = \frac{\Delta V}{\Delta H} = \frac{1}{3}$ $\quad y_1 = \frac{1}{3}(3-0,5) = 0,83333$

$Q\oplus_{máx\,S2} = 30kN/m \times 3m \times 50kN(1) + 80kN(1) + 30kN(0,83333)$

$Q\oplus_{máx\,S2} = +250\ kN$ // $Q\ominus_{máx\,S2} = \phi$ //