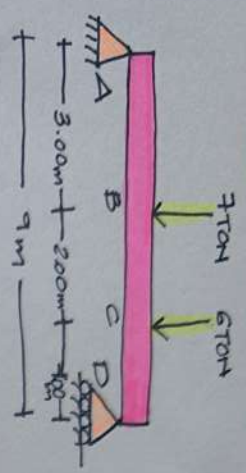
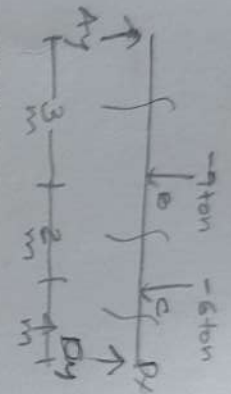


PLATAFORMA:

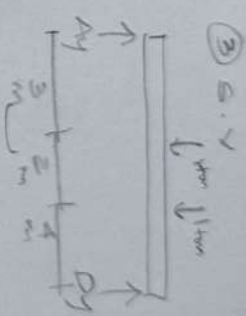
08/02/2025



• $\sum M_D = 0$
 • $\sum F_H = 0$
 • $\sum F_V = 0$



INTERVALO
 $0 \leq x \leq 3$
 $0 \leq x \leq 2$
 $0 \leq x \leq 4$



• $P_B - 1\text{ton} (3\text{m}) - 1\text{ton} (5\text{m}) - D_y (9\text{m}) = 0$
 $P_B - 3\text{ton} \cdot \text{m} - 5\text{ton} \cdot \text{m} - D_y (9\text{m}) = 0$
 $D_y (9\text{m}) = \frac{-8\text{ton} \cdot \text{m}}{9\text{m}} = 0.88\text{ton}$

$A_y = 1\text{ton} - 1\text{ton} + 0.88\text{ton}$

$A_y = -2\text{ton} + 0.88\text{ton}$

$A_y = -1.12\text{ton}$

$A_y = 1.12\text{ton}$

① $\sum M_A = 0$

$D_y (9\text{m}) - 6\text{ton} (5\text{m}) - 7\text{ton} (3\text{m}) = 0$

$D_y (9\text{m}) - 30\text{ton} \cdot \text{m} - 21\text{ton} \cdot \text{m} = 0$

$D_y = \frac{51\text{ton} \cdot \text{m}}{9\text{m}} = 5.66\text{ton}$

• $\sum F_H = 0$

$A_y = 7\text{ton} - 6\text{ton} + 5.66\text{ton} = 0$

$A_y - 7.4\text{ton} = 0$

$A_y = 7.4\text{ton}$

④ S.R

$M_1 = 7.84x$

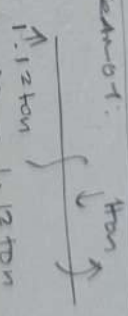
$m_1 = 1.12\text{ton}$

$M_2 = 7.84x - 7\text{ton}(x-3)$

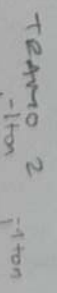
$m_2 = 1.12\text{ton} - 1\text{ton}(x-3)$

$M_3 = 5.66x$

$m_3 = 0.88x$



Intervalo: $0 \leq x \leq 3$

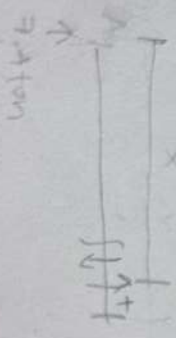


$M_2 = 1.12\text{ton} - 1\text{ton}(x-3)$

Intervalo: $3 \leq x \leq 5$

② S.R

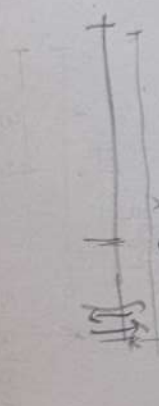
TRAMO 1:



$M_1 = 7.84\text{ton}(x)$

$M_1 = 7.84x$

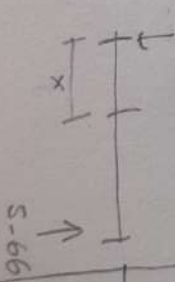
TRAMO 2:



$M_2 = 7.84(x) - 7\text{ton}(x-3)$

$M_2 = 7.84x - 7\text{ton}(x-3)$

TRAMO 3:



$M_3 = 5.66(x)$

$M_3 = 5.66x$

$M_B = 0.88x$
 Intervalo: $0 \leq x \leq 4$

$\Delta v_B = \int_0^L \frac{(M)(m)}{EI} dx$

$\Delta v_B = \int_0^3 \frac{(7.84x)(1.12x)}{EI} dx + \int_0^4 \frac{(5.66x)(0.88x)}{EI}$

$+ \int_0^4 \frac{(5.66x)(0.88x)}{EI}$

11m to 0.884m
no. 661m

$$\Delta_{XB} = \int_0^3 \frac{(9.24x)(1.12x)}{EI} dx + \frac{1}{EI} \int_0^3 (8.2208x^2) dx = \frac{1}{EI} [8.2208(x \frac{2+1}{2+1})] \Big|_0^3 = \frac{1}{EI} [8.2208(x \frac{3+1}{2+1})] \Big|_0^3$$

$$= \frac{1}{EI} [8.2208x^3] \Big|_0^3 = \frac{1}{EI} (2.7402x^3) = \frac{2.7402x^3}{EI} = \frac{2.7402(0)^3}{EI} - \frac{2.7402(3)^3}{EI} = \frac{2.7402(9)}{EI} = \frac{24.6618}{EI}$$

$$= \frac{73.9854}{EI} + \int_0^2 \frac{((7.24x - 740n)(x-3))(1.12x - 140n)(x^3))}{EI} dx = \frac{73.9854 \text{ ton/m}^3}{EI}$$

$$= \frac{1}{EI} \int_0^2 \frac{(8.2208x^2 - 740n)}{EI} dx = \frac{1}{EI} \left[\frac{8.2208x^{2+1} - 740n}{3} \right] \Big|_0^2 = \frac{1}{EI} \left[\frac{8.2208x^3 - 740n}{3} \right] \Big|_0^2$$

$$= \frac{1}{EI} (2.7402x^3 - 740n) \Big|_0^2 = \frac{2.7402x^3 - 740n}{EI} = \frac{2.7402(2)^3 - (2.7402(0)^3)}{EI}$$

$$= \frac{2.7402(8)}{EI} = \frac{21.9216 \text{ ton/m}^3}{EI}$$

$$= \frac{21.9216}{EI} + \int_0^4 \frac{(5.6602x)(0.88x)}{EI} dx = \frac{1}{EI} \int_0^4 (4.9808x^2) dx = \frac{1}{EI} [1.6602x^3] \Big|_0^4$$

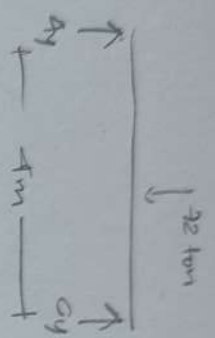
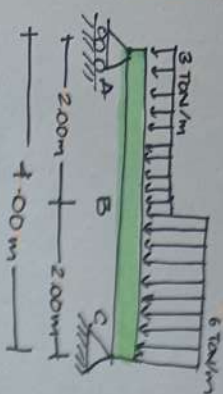
$$= \frac{1}{EI} (1.6602x^3) \Big|_0^4 = \frac{1.6602x^3}{EI} = \frac{1.6602(4)^3}{EI} - \frac{1.6602(0)^3}{EI} = \frac{1.6602(64)}{EI} = \frac{106.2528}{EI}$$

$$\Delta_{XB} = \frac{73.9854}{EI} + \frac{21.9216}{EI} + \frac{106.2528}{EI} = \frac{202.1598 \text{ ton/m}^3}{EI}$$

$$\Delta_{XB} = \frac{73.9854}{EI} + \frac{21.9216}{EI} + \frac{106.2528}{EI} = \frac{202.1598 \text{ ton/m}^3}{EI}$$

EXERCÍCIO 2:

$6 \times 2 = 12$ 92 ton
 $3 \times 2 = 6$ 92 ton

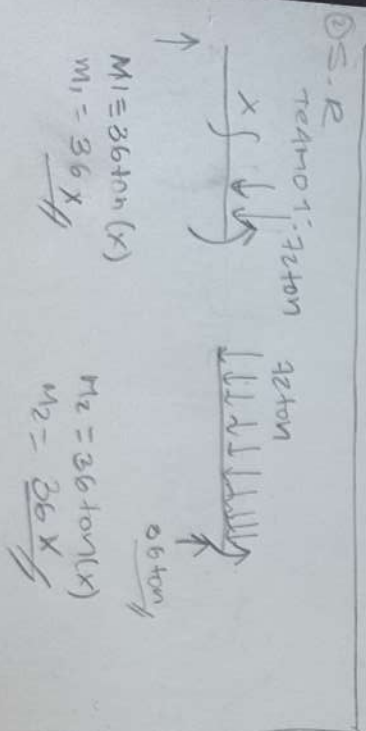


$\bullet \sum M_O = 0$
 $\bullet \sum F_x = 0$
 $\bullet \sum F_y = 0$

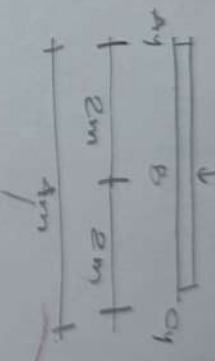
(curvatura)
 $0 \leq x \leq 2$
 $0 \leq x \leq 2$

$1. \sum M_A = 0$
 $A_y (4m) - 92 \text{ ton} \cdot m = 0$
 $A_y = 92 \text{ ton} - 144 \text{ ton} \cdot m = 0$
 $A_y = 144 \text{ ton} \cdot m = 36 \text{ ton}$

$\sum F_y = 0$
 $c_y = 92 \text{ ton} + 36 \text{ ton} = -36 \text{ ton}$
 $c_y = 36 \text{ ton}$



3) S.V.



$\sum M = 0$
 $\sum M_A = 0$

$\bullet A_y (4m) - 1 \text{ ton} (2m) = 0$ $c_y = 1 \text{ ton} + 0.5m$
 $A_y (4m) - (2m) = 0$ $c_y = 0.5m$
 $A_y = 2m / 4m = 0.5m$

S.R.
 $M_1 = 36x$
 $M_2 = 36x$
 $m_1 = 0.5x$
 $m_2 = 0.5x$

$\bullet \text{CORTE 1: } -1m$
 x
 $\bullet \text{CORTE 2: } -1.5m$
 x

$M_2 = 0.5m(x)$
 $M_2 = 0.5x$

$\textcircled{4} \Delta_{VB} = \int_0^2 \frac{(M_2)(M_3)}{EI} dx$

$\Delta_{VB} = \int_0^2 \frac{(36x)(0.5x)}{EI} dx + \int_0^2 \frac{(36x)(0.5x)}{EI} dx$

$\Delta_{VB} = \int_0^2 \frac{(36x)(0.5x)}{EI} dx = \frac{1}{EI} \int_0^2 (18x^2) dx = \frac{1}{EI} (18 \frac{x^3}{3}) \Big|_0^2$

$= \frac{1}{EI} [18 (\frac{x^3}{3})] \Big|_0^2 = \frac{1}{EI} [18 \frac{x^3}{3}] \Big|_0^2 = \frac{1}{EI} (6x^3) \Big|_0^2$

$= \frac{6x^3}{EI} = \frac{6(2)^3}{EI} = \frac{6(8)}{EI} = \frac{48}{EI} = \frac{48}{EI} = 48 \text{ ton/m}^3$