



# Mi Universidad

*Nombre del Alumno Ervin Altamirano Jimenez*

*Nombre del tema:*

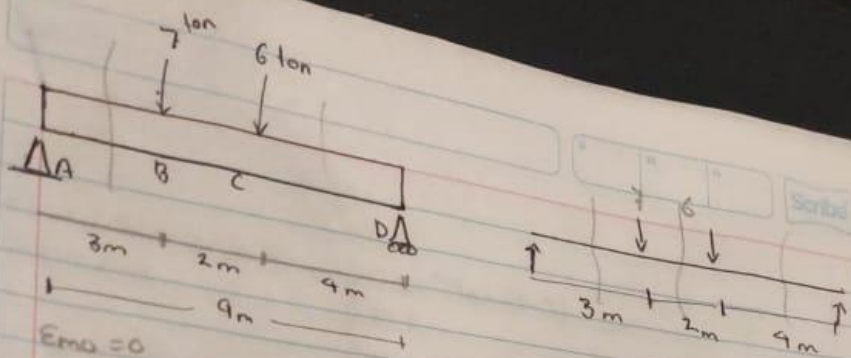
*Parcial: 3ro*

*Nombre de la Materia: Taller de contruccion de materiales basicos*

*Nombre del profesor: Arq.Pera*

*Nombre de la Licenciatura: Arquitectura*

m



$$\begin{aligned} \sum M_A &= 0 \\ \sum F_x &= 0 \\ \sum F_y &= 0 \end{aligned}$$

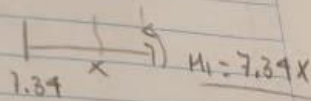
$$\sum F_x = 0$$

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

$$D_y(9m) - 21 \text{ ton/m} - 30 \text{ ton/m}$$

$$D_y(9m) = 51 \text{ ton/m}$$

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



$$M_1 = 7.39x$$

$$M_2 = 7.39 \text{ ton} \cdot x - 7 \text{ ton}(x-3)$$

$$\begin{aligned} A_y &= -7 \text{ ton} - 6 \text{ ton} + 5.66 \\ A_y &= 7.39 \end{aligned}$$

Free body diagram of a beam segment of length  $x$  from the right end. It shows a reaction of 5.66 at the right end and a distributed load of 7.39 ton/m. The moment is  $M_3 = 5.66x$ .

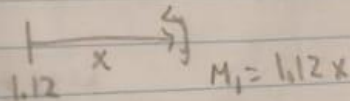
S.V

$$D_y(9m) - 7 \text{ ton}(3m) - 1 \text{ ton}(5m)$$

$$D_y(9m) - 21 \text{ ton/m} - 5 \text{ ton/m}$$

$$D_y(9m) = 26 \text{ ton/m}$$

$$D_y = \frac{26 \text{ ton/m}}{9m} = 0.88 \text{ ton/m}$$



$$M_2 = 1.12x - 7 \text{ ton}(x-3)$$

$$A_y = 7 - 7 + 0.88$$

$$A_y = 1.12$$

Free body diagram of a beam segment of length  $x$  from the right end. It shows a reaction of 0.88 at the right end and a distributed load of 0.88 ton/m. The moment is  $M_3 = 0.88x$ .

	S.R	S.V
M <sub>1</sub>	7.34x	1.12x
M <sub>2</sub>	7.34x - 7fon(x-3)	1.12x - 7fon(x-3)
M <sub>3</sub>	5.66x	0.88x

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$\int_a^b F(x) dx = F(b) - F(a)$$

Intervalos  
 $0 \leq x \leq 3$   
 $0 \leq x \leq 5$   
 $0 \leq x \leq 4$

$$\Delta_{UB} \int_0^V \frac{(MR)(ms)}{EI}$$

$$\Delta_{UB} = \int_0^3 \frac{(7.34x)(1.12x)}{EI} dx = \frac{1}{EI} \int_0^3 (8.2208x^2) dx =$$

$$= \frac{1}{EI} \left[ \frac{8.2208(x^{n+1})}{n+1} \right]_0^3 = \left[ \frac{8.2208(x^{2+1})}{2+1} \right]_0^3$$

$$= \frac{1}{EI} \left[ \frac{8.2208x^3}{3} \right]_0^3 = \frac{1}{EI} \left( \frac{2.7402x^3}{1} \right)_0^3 = \frac{2.7402x^3}{EI}$$

$$\frac{2.7402(3)^3}{EI} - \frac{2.7402(0)^3}{EI} = 73.9864$$

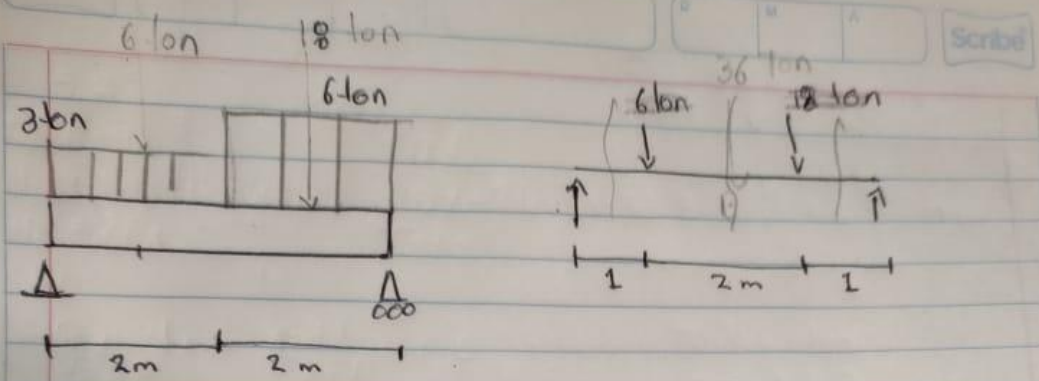
$$\Delta v_B \int_0^4 \frac{(5.66x)(0.88x)}{EI} dx = \frac{1}{EI} \int_0^4 (4.9808x^2) dx >$$

$$= \frac{1}{EI} \left[ 4.9808 \left( \frac{x^{2+1}}{2+1} \right) \right]_0^4 = \left[ 4.9808 \left( \frac{x^3}{3} \right) \right]_0^4$$

$$= \frac{1}{EI} \left[ \frac{4.9808x^3}{3} \right]_0^4 = \frac{1}{EI} \left( \frac{1.6602x^3}{1} \right) \Big|_0^4 = \frac{1.6602x^3}{EI} \Big|_0^4$$

$$= \frac{1.6602(4)^3}{EI} - \frac{1.6602(0)^3}{EI} = \frac{1.6602(64)}{EI} = 106.2528$$





$\sum M_0 = 0$   
 $\sum F_x = 0$   
 $\sum F_y = 0$

$\sum F_x = 0$

$C_y(4) = 3 \text{ ton} + 18 \text{ ton} - 18 \text{ ton}$

$C_y(4) = 6 \text{ ton/m} \times 4 = 24 \text{ ton}$

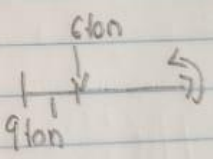
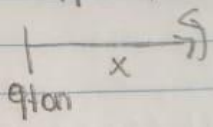
$C_y(4) = 24 \text{ ton}$

$C_y = \frac{24 \text{ ton}}{4} = 6 \text{ ton/m}$

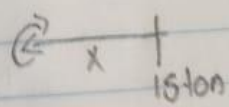
$A_y = -6 \text{ ton} - 18 \text{ ton} + 24 \text{ ton}$

$A_y = 0 \text{ ton}$

$M_1 = 9 \text{ ton} \cdot x$



$M_2 = 9 \text{ ton} \cdot x - 6 \text{ ton} \cdot (x - 1)$



$M_3 = 15 \text{ ton} \cdot x$

S.V

$C_y(4) = 1 \text{ ton} + 3 \text{ ton}$

$C_y(4) = 4 \text{ ton}$

$C_y = \frac{4}{4} = 1 \text{ ton/m}$

$$\Delta v_B = \int_0^6 \frac{(2x)(0.33x)}{EI} dx = \frac{1}{EI} \int_0^6 (0.66x^2) dx = \frac{1}{EI} \left[ 0.66 \left( \frac{x^{3+1}}{3+1} \right) \right]_0^6 =$$

$$= \left[ 0.66 \left( \frac{x^{2+1}}{2+1} \right) \right]_0^6 = \frac{1}{EI} \left[ \frac{0.66x^3}{3} \right]_0^6 = \frac{1}{EI} \left( \frac{0.22x^3}{1} \right) \Big|_0^6$$

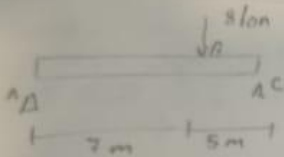
Formula función

$$= \frac{0.22x^3}{EI} \Big|_0^6 = \frac{0.22(6)^3}{EI} - \frac{0.22(0)^3}{EI} = \frac{0.22(216)}{EI} = \frac{47.52}{EI}$$

$$\Delta v_B = \frac{29.111}{EI} + \frac{47.52}{EI} = \frac{71.63}{EI}$$

$$\Delta v_B = \frac{71.63}{EI} \text{ ton/m}^3$$

$$\int_0^x \frac{(M_1)(M_2)}{EI} dx$$



$$\begin{aligned} \epsilon_m &= 0 \\ \epsilon_{fx} &= 0 \\ \epsilon_{fy} &= 0 \end{aligned}$$

$$C_x(12m) - 8 \text{ ton}(7m) = 0$$

$$C_y(12m) - 56 \text{ ton/m} = 0$$

$$C_y(12m) = 56 \text{ ton/m} = 0$$

$$C_y = \frac{56}{12} = 4.666$$

$$A_y = -8 \text{ ton} + 4.666$$

$$A_y = 3.34$$

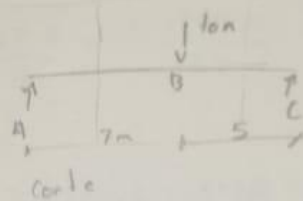
$$C_x(12m) - 1(7)$$

$$C_x = 7/12$$

$$C_x = 0.583$$

$$A_y = -1 + 0.583$$

$$A_y = 0.417$$



$$M_1 = 3.34x$$

$$M_2 = 4.66x$$

$$m_1 = 0.417x$$

$$m_2 = 0.583x$$

Integral

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$① 0 \leq x \leq 7$$

$$② 0 \leq x \leq 5$$

Integral derimada

$$\int_a^b F(x) dx = F(b) - F(a)$$

$$\Delta_{VB} = \int_0^L \frac{(MR)(m)}{EI}$$

$$\Delta_{VB} = \int_0^7 \frac{(3.59x)(6.917x)}{EI} dx = \frac{1}{EI} \int_0^7 (1.392x^2) dx = \frac{1}{EI} \left[ 1.392 \left( \frac{x^{n+1}}{n+1} \right) \right]_0^7$$

$$= \left[ 1.392 \left( \frac{x^{2+1}}{2+1} \right) \right]_0^7 = \frac{1}{EI} \left[ \frac{1.392x^3}{3} \right]_0^7 = \frac{1}{EI} \left( \frac{0.969x^3}{1} \right)_0^7$$

$$= \frac{0.969x^3}{EI} = \frac{0.969(7)}{EI} - \frac{0.969(0)^3}{EI} = \frac{0.969(343)}{EI} = \frac{159.152}{EI}$$

$$\Delta_{VB} = \int_0^5 \frac{(4.66x)(0.583x)}{EI} dx = \frac{1}{EI} \int_0^5 (2.716x^2) dx = \frac{1}{EI} \left[ 2.716 \left( \frac{x^{n+1}}{n+1} \right) \right]_0^5$$

$$= \left[ 2.716 \left( \frac{x^{2+1}}{2+1} \right) \right]_0^5 = \frac{1}{EI} \left[ \frac{2.716x^3}{3} \right]_0^5 = \frac{1}{EI} \left( \frac{0.905x^3}{1} \right)_0^5$$

$$= \frac{0.905x^3}{EI} = \frac{0.905(5)^3}{EI} - \frac{0.905(0)^3}{EI} = \frac{0.905(125)}{EI} = \frac{113.125}{EI}$$

$$\Delta_{VB} = \frac{159.152}{EI} + \frac{113.125}{EI} = \frac{272.277}{EI}$$

$$\Delta_{VB} = \frac{272.277}{EI} \text{ ton/m}$$