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Nombre del Alumno: Ana Cristell Gómez Rodríguez

Nombre del tema: Líneas de Influencia

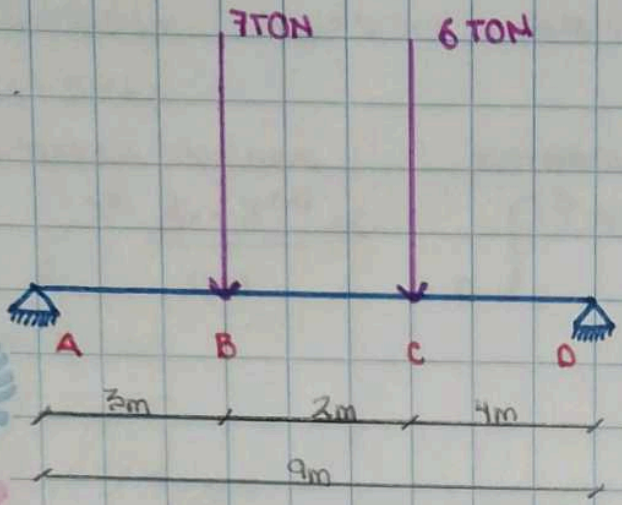
Parcial: 3ro

Nombre de la Materia: Análisis de Estructuras

Nombre del profesor: Arq. Perla Marisol Barajas

Nombre de la Licenciatura: Arquitectura

Cuatrimestre: 5to



$\sum FX=0$

$\sum MA=0$

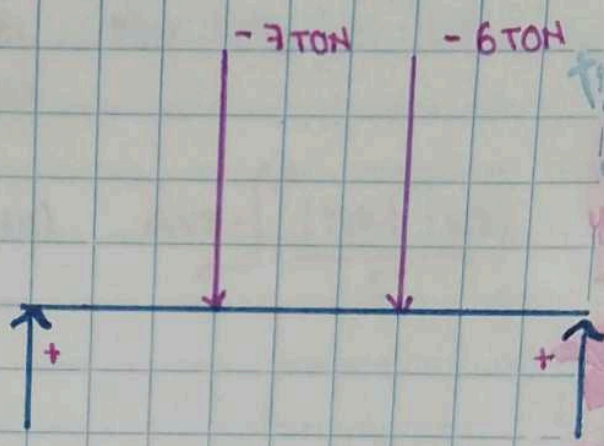
$Dy(9m) - 6TON(3m) - 7TON(3m)$

$Dy(9m) - 30\ TON/m - 21\ TON/m$

$Dy(9m) - 51\ TON/m$

$Dy = 51\ TON/m \div 9m$

$Dy = 5.66\ TON$



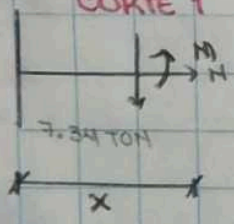
$Fy=0$

$Ay + 7TON - 6TON + 5.66\ TON$

$Ay + 13TON + 5.66\ TON$

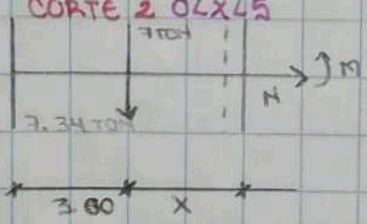
$Ay = 7.34\ TON$

CORTE 1 $0 < X < 3$



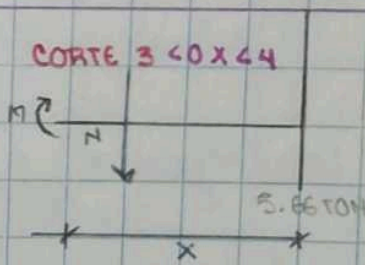
$M_1 = 7.34X$

CORTE 2 $0 < X < 5$



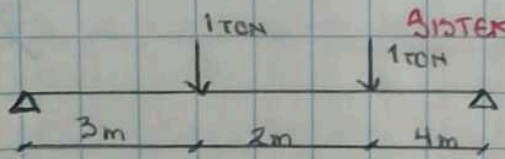
$M_2 = 7.34X - 7TON(X - 3.00)$

CORTE 3 $<0 X < 4$



$M_3 = 5.66X$

SISTEMA VIRTUAL



$Dy(9m) - 1TON(5m) - 1TON(2m)$

$Dy(9m) - 5\ TON/m - 3\ TON/m$

$Dy(9m) - 8\ TON/m$

$Dy = 8\ TON/m \div 9m$

$Dy = 0.88$

$Ay - 1TON - 1TON + 0.88$

$Ay - 2 + 0.88$

$Ay = 1.12$

CORTE 1 $0 < X < 3$

$M_1 = 1.12X$

CORTE 2 $<0 < X < 5$

$M_2 = 1.12X - 1TON(X - 3)$

CORTE 3 $<0 X < 4$

$M_3 = 0.88X$

SR

$M_1 = 7.34X$ $M_2 = 7.34X - 7TON(X-3)$

$M_3 = 5.66X$

SV

$M_1 = 1.12X$ $M_2 = 1.12X - 1TON(X-3)$

$M_3 = 0.88X$

FORMULA INTEGRAL

$$\int X^n \frac{dx - X^{n+1}}{n+1} + C$$

INTEGRAL DEFINIDA

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

$$\Delta VB = \int_d^L \frac{(MR)(MS)}{EI}$$

1- $0 < X < 3$

2- $0 < X < 5$

3- $0 < X < 4$

1- $\Delta VB = \int_0^3 \frac{(7.34x)(1.12x)}{EI} dx = \frac{1}{EI}\int_0^3 (8.22x^2)\,dx = \frac{1}{EI}\left[8.22\left(\frac{x^{n+1}}{n+1}\right)\right]_0^3 =$

$\frac{1}{EI}\left[8.22\left(\frac{x^{2+1}}{2+1}\right)\right]_0^3 = \frac{1}{EI}\left[\frac{8.22x^3}{3}\right]_0^3 = \frac{1}{EI}\left(\frac{2.74x^3}{1}\right)\Big|_0^3 = \frac{2.74x^3}{EI}$

$\frac{2.74(3)^3}{EI} - \frac{2.74(0)^3}{EI} = \frac{2.74(27)}{EI} = \frac{73.98}{EI}$

2- $\Delta VB \int_0^5 \frac{(7.34x - 7TON(x-3))(1.12x - 1TON(x-3))}{EI} dx = \frac{1}{EI}\int_0^5 (8.22x^2 - 7TON)\,dx$

$\frac{1}{EI}\left[8.2208\left(\frac{x^{n+1}}{n+1}\right)\right]_0^5 = \frac{1}{EI}\left[8.2208\left(\frac{x^{2+1}}{2+1}\right) - 7TON\right]_0^5 = \frac{1}{EI}\left[\frac{8.2208x^3 - 7TON}{3}\right]_0^5$

$\frac{1}{EI}\left(\frac{2.74x^3 - 7TON}{1}\right)\Big|_0^5 = \frac{2.7402x^3 - 7TON}{EI} = \frac{2.7402(5)^3}{EI} - \frac{2.7402(0)^3}{EI}$

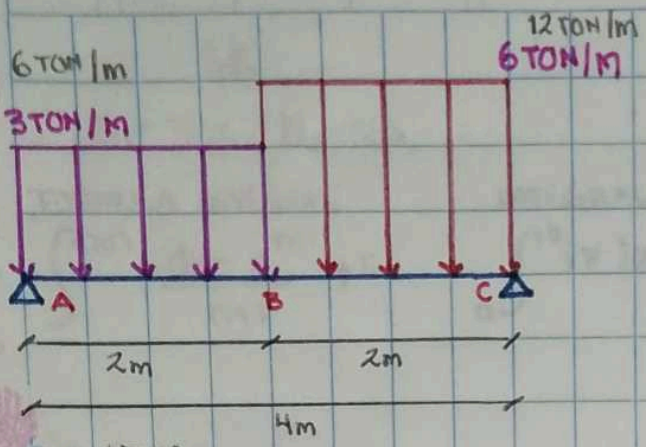
$= \frac{2.7402(125)}{EI} = \frac{342.525}{EI}$

3- $\Delta VB = \int_0^4 \frac{(5.66x)(0.88x)}{EI} dx = \frac{1}{EI}\int_0^4 (4.98x^2)\,dx = \frac{1}{EI}\left[4.98\left(\frac{x^{n+1}}{n+1}\right)\right]_0^4 =$

$\frac{1}{EI}\left[4.98\left(\frac{x^{2+1}}{2+1}\right)\right]_0^4 = \frac{1}{EI}\left[\frac{4.98x^3}{3}\right]_0^4 = \frac{1}{EI}\left(\frac{1.66x^3}{1}\right)\Big|_0^4 = \frac{1.66x^3}{EI} =$

$\frac{1.66(4)^3}{EI} - \frac{1.66(0)^3}{EI} = \frac{1.66(64)}{EI} = \frac{106.24}{EI}$

$\Delta VB = \frac{73.98}{EI} + \frac{342.525}{EI} + \frac{106.24}{EI} = \frac{522.745}{EI}$



$\Sigma FX=0$

$\Sigma MA=0$

$Cy(4m) - 72\ TON/m\ (2m)$

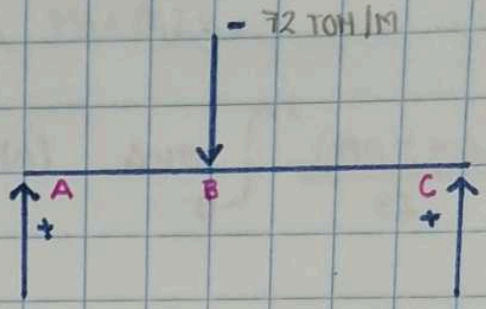
$Cy(4m) - 144\ TON/m$

$Cy = \frac{144\ TON/m}{4m} = 36\ TON$

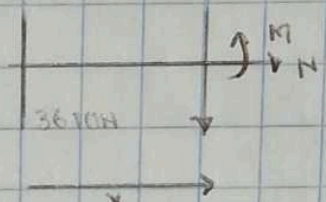
$Ay - 72\ TON/m + 36\ TON$

$Ay - 36\ TON/m$

$Ay = 36\ TON$

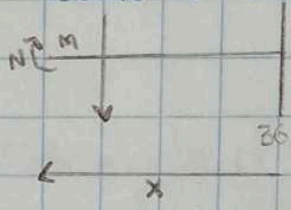


CORTE 1 $0 \leq X \leq 2$

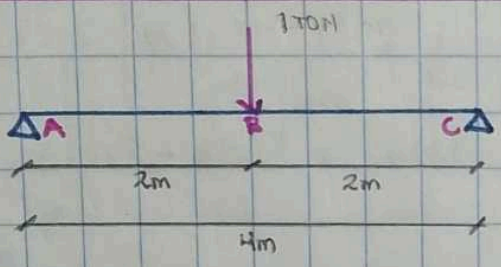


$M_1 = 36X$

CORTE 2 $0 \leq X \leq 2$



$M_2 = 36X$



$\Sigma FX=0$

$\Sigma MA=0$

$Cy(4m) - 1\ TON\ (2m)$

$Cy(4m) - 2\ TON/m$

$Cy = \frac{2\ TON/m}{4m} = 0.5\ TON$

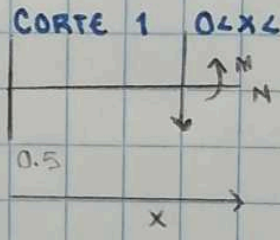
$\Sigma Fy=0$

$Ay - 1\ TON/m + 0.5\ TON$

$Ay - 0.5\ TON$

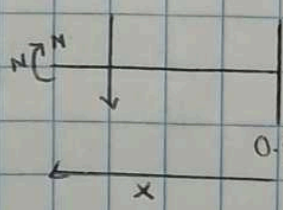
$Ay = 0.5\ TON$

CORTE 1 $0 \leq X \leq 2$



$M_1 = 0.5X$

CORTE 2 $0 \leq X \leq 2$



$M_2 = 0.5X$

SR

$M_1 = 36x \quad M_2 = 36x$

SV

$M_1 = 0.5x \quad M_2 = 0.5x$

FORMULA INTEGRAL

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

INTEGRAL DEFINIDA

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

$$\Delta VB = \int_0^L \frac{(MR)(MS)}{EI}$$

1- $0 < x < 2$

2- $0 < x < 2$

1- $$\Delta VB = \int_0^2 \frac{(36x)(0.5x)}{EI} dx = \frac{1}{EI} \int_0^2 (18x^2) dx = \frac{1}{EI} \left[18 \frac{(x^{n+1})}{n+1} \right]_0^2 =$$

$$\frac{1}{EI} = \left[18 \frac{(x^{2+1})}{2+1} \right]_0^2 = \frac{1}{EI} \left[\frac{18x^3}{3} \right]_0^2 = \frac{1}{EI} \left[\frac{6x^3}{1} \right]_0^2 = \frac{6x^3}{EI} \Big|_0^2 = \frac{6(2)^3}{EI} - \frac{6(0)}{EI}$$

$$= \frac{6(8)}{EI} = \frac{48}{EI}$$

2- $$\Delta VB = \int_0^2 \frac{(36x)(0.5x)}{EI} dx = \frac{1}{EI} \int_0^2 (18x^2) dx = \frac{1}{EI} \left[18 \frac{(x^{n+1})}{n+1} \right]_0^2 =$$

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

$$\frac{6(2)^3}{EI} - \frac{6(0)^3}{EI} = \frac{6(8)}{EI} = \frac{48}{EI}$$

$$\Delta VB = \frac{48}{EI} + \frac{48}{EI} = \frac{96}{EI}$$