



# Mi Universidad

*Nombre del Alumno Ervin Altamirano Jimenez*

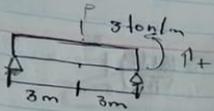
*Nombre del tema:*

*Parcial: 3ro*

*Nombre de la Materia: Analisis de estructuras*

*Nombre del profesor: Arq.Pera*

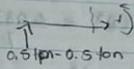
*Nombre de la Licenciatura: Arquitectura*



• Determinar la flexión en el centro de la viga

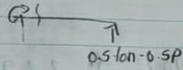
$$0 \leq x \leq 3$$

Corte 1



$$M_1 = 0.5P(x) - 0.5 \text{ ton}(x)$$

Corte 2



$$M_2 = -0.5 \text{ ton}(x) + 0.5P(x)$$

$$\sum m_o = 0$$

$$C_x = (6m) 3 \text{ ton/m} - P(3m) = 0$$

$$C_y = -3 \text{ ton/m} \cdot 6m + P(3/6) = 0$$

$$C_y = -0.5 \text{ ton/m} + 0.5P$$

$$A_x - P + C_x = 0$$

$$A_y = -P (-0.5 \text{ ton} + 0.5P)$$

$$A_y = +0.5P + 0.5 \text{ ton}$$

$$\frac{dm}{dx} = 0.5x \rightarrow M_1$$

$$\frac{dm}{dx} = 0.5x \rightarrow M_2$$

Formula 
$$\Delta = \int_0^L \frac{(M) \left(\frac{dm}{dx}\right)}{EI} dx$$

$$\Delta = \int_0^3 \frac{(0.5x)(0.5x)}{EI} dx + \int_0^3 \frac{(-0.5x - 3)(0.5x)}{EI} dx$$

$$\Delta = \int_0^3 \frac{+0.25x^2}{EI} dx + \int_0^3 \frac{(-0.25x^2 + 1.5x)}{EI} dx$$

$$\Delta = -0.25 \left( \frac{x^{2+1}}{2+1} \right) + 0.25 \left( \frac{x^{2+1}}{2+1} \right) \Big|_0^3 - \left[ \frac{1x^{2+1}}{1+1} \right] \Big|_0^3$$

$$\Delta = \frac{-0.25x^3}{3} + \frac{0.25x^3}{3} - \frac{1x^2}{2}$$

$$= \frac{-0.0833(3)^3}{1} + \frac{0.0833(3)^3}{1} - \frac{0.75(9)}{1}$$

$$= \frac{-0.0833(27)}{EI} + \frac{0.0833(81)}{EI} + \frac{0.75(9)}{EI}$$

$$+ \frac{2.2967}{EI} = \frac{2.2967}{EI} + \frac{6.75}{EI}$$

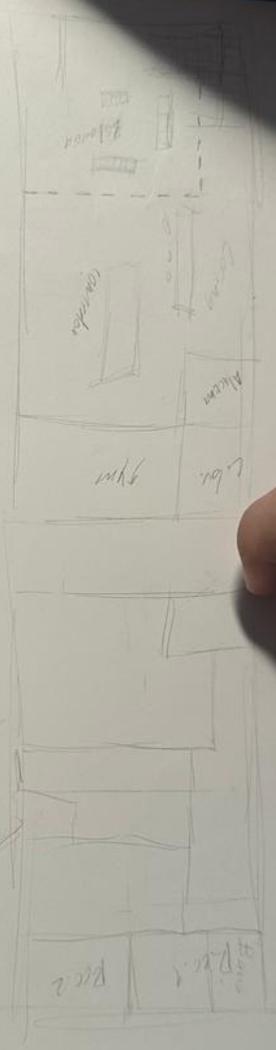
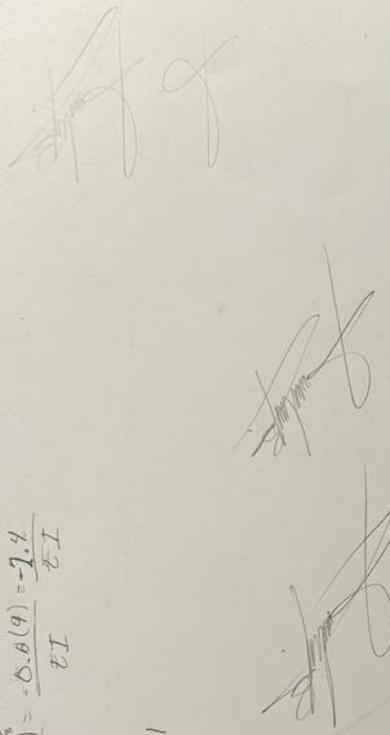
$$0.75$$

$$\Delta = \frac{7.0467}{EI}$$

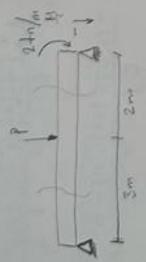
$$\Delta \psi = \int_0^2 \frac{(-2)(0.6x)}{EI} dx = \frac{1}{EI} \int_0^2 (-1.2x) dx = \frac{1}{EI} \left[ -0.6x^2 \right]_0^2 = \frac{-0.6 \times 4}{EI} = \frac{-2.4}{EI}$$

$$-0.4x^2 \int_0^2 \frac{1}{EI} dx = \frac{-0.4}{EI} \int_0^2 1 dx = \frac{-0.4}{EI} [x]_0^2 = \frac{-0.4 \times 2}{EI} = \frac{-0.8}{EI}$$

$$-1.931 + 0.64 - 2.4 = -3.191$$



$$\int_0^2 \frac{1.2}{EI} dx = \frac{1.2}{EI} [x]_0^2 = \frac{1.2 \times 2}{EI} = \frac{2.4}{EI}$$



1. Aplicar Carga P<sup>o</sup>

$\sum M_D = 0$

$C_y(5m) - 2m \cdot m - P(2m) = 0$

$C_y = 2 \text{ ton} \cdot m / 5m - P(3m/5m)$

$C_y = 0.4 \text{ ton} - 0.6P$

$A_y - P + C_y = 0$

$A_y = P - (0.4 \text{ ton} - 0.6P)$

$A_y = 0.4P - 0.4 \text{ ton}$

Determinar la deflexión en el Punto "B" de la viga.

$M_1 = \frac{am}{ap} = 0.4x$

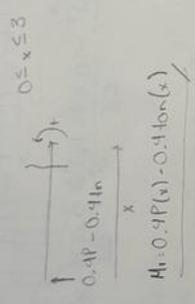
$M_2 = \frac{am}{ap} = 0.6x$

Integral:

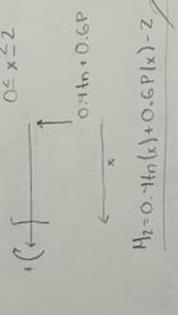
Formula

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

Corte 1



Corte 2



$M_2 = 0.4P(x) + 0.6P(x) - Px$

$\Delta_{VB} = \int_0^2 \frac{(-0.4x)(0.4x) dx}{EI} + \int_0^2 \frac{(-0.16x^2)}{EI} dx - \frac{1}{EI} \int_0^2 \frac{(-0.16(x^{n+1}))}{n+1} dx = \frac{1}{EI} \int_0^2 \frac{(-0.16(x^{n+1}))}{n+1} dx$

Integral

$\Delta = \int_0^2 \frac{(-0.4x)(0.4x) dx}{EI} + \int_0^2 \frac{(-0.16x^2)}{EI} dx - \frac{1}{EI} \int_0^2 \frac{(-0.16(x^{n+1}))}{n+1} dx = \frac{1}{EI} \int_0^2 \frac{(-0.16x^3)}{3} dx = \frac{-0.0533x^3}{EI} \Big|_0^2 = \frac{-0.0533(8)}{EI} = \frac{-0.4264}{EI}$

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