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Nombre del tema: INESTABILIDAD ELASTICA

Unida: 4

Nombre de la Materia: ANALISIS DE ESTRUCTURAS

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Nombre de la Licenciatura: Arquitectura

Cuatrimestre: 5

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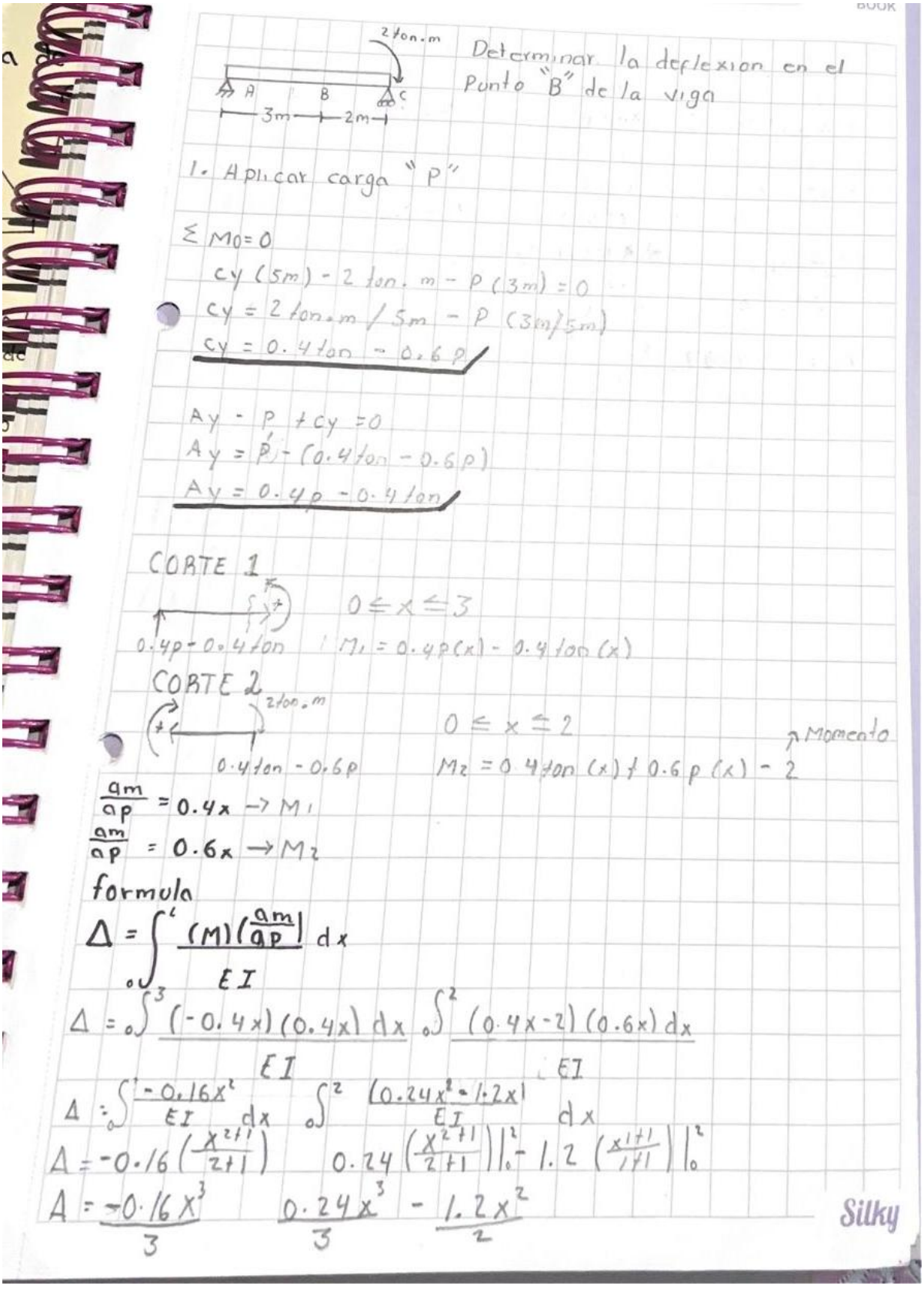
2 ton.m
A
B
C
3m
2m
Determinar la deflexion en el Punto "B" de la viga
1. Aplicar carga "P"
$\Sigma M_0 = 0$
$cy(5m) - 2\ ton.m - P(3m) = 0$
$cy = 2\ ton.m / 5m - P(3m/5m)$
$cy = 0.4\ ton - 0.6P$
$Ay - P + cy = 0$
$Ay = P - (0.4\ ton - 0.6P)$
$Ay = 0.4P - 0.4\ ton$
CORTE 1
$0 \leq x \leq 3$
$0.4P - 0.4\ ton$
$M_1 = 0.4P(x) - 0.4\ ton(x)$
CORTE 2
2 ton.m
$0 \leq x \leq 2$
Momento
$0.4\ ton - 0.6P$
$M_2 = 0.4\ ton(x) + 0.6P(x) - 2$
$\frac{am}{ap} = 0.4x \rightarrow M_1$
$\frac{am}{ap} = 0.6x \rightarrow M_2$
formula
$\Delta = \int_0^L \frac{(M)(\frac{am}{ap})}{EI} dx$
$\Delta = \int_0^3 \frac{(-0.4x)(0.4x)\,dx}{EI} \int_0^2 \frac{(0.4x-2)(0.6x)\,dx}{EI}$
$\Delta = \int_0^3 \frac{-0.16x^2}{EI} dx \int_0^2 \frac{(0.24x^2 - 1.2x)}{EI} dx$
$\Delta = -0.16\left(\frac{x^{2+1}}{2+1}\right) \quad 0.24\left(\frac{x^{2+1}}{2+1}\right)\Big|_0^2 - 1.2\left(\frac{x^{1+1}}{1+1}\right)\Big|_0^2$
$A = \frac{-0.16x^3}{3} \quad \frac{0.24x^3}{3} - \frac{1.2x^2}{2}$
Silky

SMART BOOK

$$-\frac{0.0533x^3}{1} + \frac{0.08x^3}{1} - \frac{0.6x^2}{1}$$

$$-\frac{0.0533(3)^3}{IE} + \frac{0.08(2)^3}{IE} - \frac{0.6(2)^2}{IE}$$

$$-\frac{0.0533(27)}{EI} + \frac{0.08(8)}{EI} - \frac{0.6(4)}{IE}$$

$$-\frac{1.4391}{EI} + \frac{0.64}{EI} - \frac{2.4}{EI}$$

$$\Delta = \frac{-3.1791}{EI} \uparrow +$$


SMART BOOK
3 TON.m
A
B
C
3m
3m
• Determinar la deflexion en el centro de la Viga.
1. Aplicar carga "P"
ΣMO =
Cy (6m) + 3 TON.m + P (3m) = 0
Cy = -3 TON.m / 6m + P (3m/6m)
Cy = -0.5 TON + 0.5 P
Ay - P - cy = 0
Ay - P (0.5 TON + 0.5p)
Ay = 0.5p + 0.5 TON
CORTE 1
0 ≤ x ≤ 3
M1 = 0.5P(x) - 0.5TON(x)
0.5P - 0.5TON
0 ≤ x ≤ 3
M2 = 0.5TON (x) + [0.5p(x)
0.5TON - 0.5P
+ 3
am/ap = 0.5 x M1
am/ap = 0.5 x M2
formula
Silky