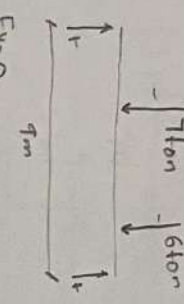


$\sum F_x = 0$
 $\sum F_y = 0$
 $\sum M_A = 0$
 $A_y - 1 \text{ ton} - 6 \text{ ton} + 3 \cdot 6 \text{ ton} = 0$
 $A_y = 13 \text{ ton} + 5.66 \text{ ton} = 0$
 $A_y = 1.34 \text{ ton}$



F. Integral:
 $\int_{n+1}^n dx - x^{n+1} + C$
 $\int_a^b f(x) dx = F(b) - F(a)$
 $\Delta V_B = \int_a^b \frac{M(x)}{EI} dx$

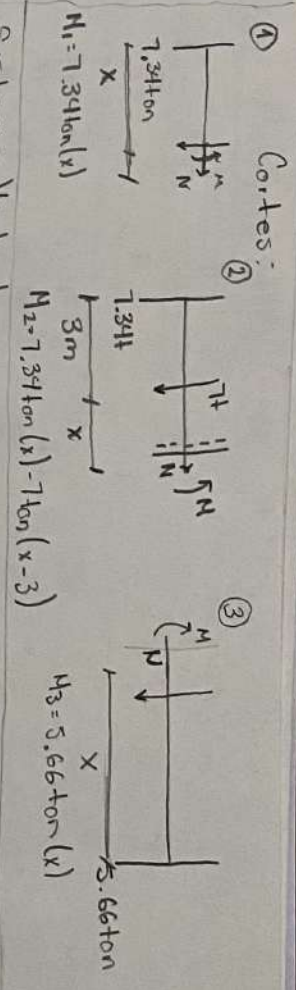
$D_1 (9m) = 6 \text{ ton} (5m) - 7 \text{ ton} (3m) = 0$
 $D_1 (9m) = 30 \text{ ton/m} - 21 \text{ ton/m} = 0$
 $D_1 (9m) = 54 \text{ ton/m} = 0$
 $D_1 = 51 \text{ ton/m} = 0$
 $D_1 = 5.66 \text{ ton}$

$1^o \Delta V_A = 0$
 $2^o \Delta V_A = 0$
 $3^o \Delta V_A = 0$
 $1^o \Delta V_B = \int_0^3 \frac{(1.34x)(4.12x)}{EI} dx = \frac{1}{EI} \int_0^3 (6.22x^2) dx = \frac{1}{EI} \left[\frac{6.22x^3}{3} \right]_0^3 = \frac{1}{EI} \left[\frac{8.22(27)}{3} \right] = \frac{2.74(3)^2}{EI} = 2.74(27) = 73.98$

$2^o \Delta V_B = \int_0^6 \frac{(1.34x - 7 + (x-3)(4.12x - 14(x-3)))}{EI} dx = \frac{1}{EI} \int_0^6 (8.22x^2 - 7 + \dots) dx = \frac{1}{EI} \left[\frac{8.22x^3}{3} - 7x + \dots \right]_0^6 = \frac{1}{EI} \left[\frac{8.22(216)}{3} - 42 + \dots \right] = \frac{342.52}{EI}$

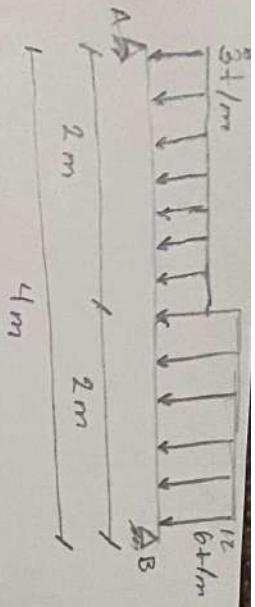
$3^o \Delta V_B = \int_0^4 \frac{(5.66x)(0.88x)}{EI} dx = \frac{1}{EI} \int_0^4 (4.98x^2) dx = \frac{1}{EI} \left[\frac{4.98x^3}{3} \right]_0^4 = \frac{1}{EI} \left[\frac{4.98(64)}{3} \right] = \frac{1.66(64)^2}{EI} = \frac{106.24}{EI}$

$\Delta V_B = \frac{73.98}{EI} + \frac{342.52}{EI} + \frac{106.24}{EI} = \frac{522.74}{EI}$

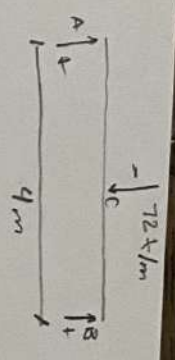


Sistema Virtual

$D_1 (9m) = 1 \text{ ton} (5m) - 1 \text{ ton} (3m) = 0$ $D_1 (9m) = 5 \text{ ton/m} - 3 \text{ ton/m} = 0$ $D_1 (9m) = 8 \text{ ton/m} = 0$ $D_1 = 0.88 \text{ ton}$	$D_2 = 0.88 \text{ ton}$
$M_1 = 1.34x$ $M_2 = 7.34x - 1 \text{ ton}(x-3)$ $M_3 = 5.66x$	$M_1 = 1.12x$ $M_2 = 1.12x - 1 \text{ ton}(x-3)$ $M_3 = 0.88x$



$\sum F_x = 0$
 $\sum M_A = 0$
 $F_y(4m) - 72t/m(2m) = 0 \Rightarrow A_y = 36 \text{ ton}$
 $F_y(4m) - 144t/m = 0$
 $F_y = \frac{144t/m}{4m} = 36 \text{ ton/m}$

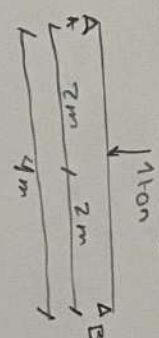


SP
 $M_1 = 36x$ $M_2 = 36x$
 SV
 $M_1 = 0.5x$ $M_2 = 0.5x$

$x = 0 < x < 2$
 $x = 2 < x < 4$

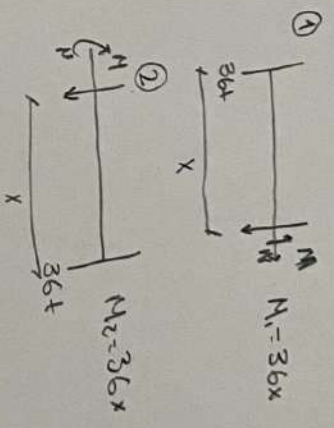
$\Delta V_B = \int_0^2 \frac{(30x)(0.5x) dx}{EI} + \int_2^4 \frac{(18x^2) dx}{EI}$
 $= \frac{1}{EI} \left[\frac{18x^3}{3} \right]_0^2 + \frac{1}{EI} \left[\frac{18x^3}{3} \right]_2^4$
 $= \frac{1}{EI} \left[\frac{18(8)}{3} + \frac{18(64 - 8)}{3} \right] = \frac{1}{EI} [48 + 144] = \frac{192}{EI}$

Systema Virtual



$\sum F_x = 0$
 $\sum M_A = 0$
 $F_y(4m) - 1 \text{ ton}(2m) = 0 \Rightarrow F_y = 0.5 \text{ ton/m}$
 $F_y = \frac{2t/m}{4m} = 0.5 \text{ ton/m}$

Cortes



FFy = 0

$A_y = 140 \text{ ton/m} + 0.5 \text{ ton} = 0$
 $A_y = 0.5 \text{ ton} = 0$
 $A_y = 0.5 \text{ ton}$

Cortes:

