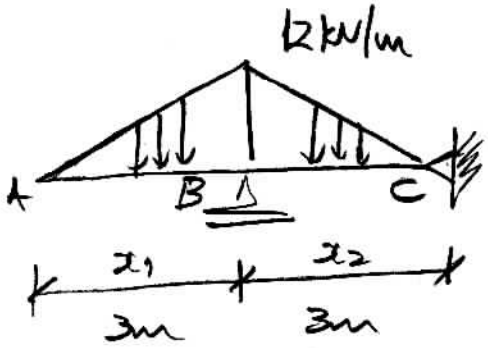
TE1-3.8



$$q_{AB}(x_1) = \frac{12-0}{3}\,x = 4x$$

$$q_{BC}(x_2) = -4x + 12$$

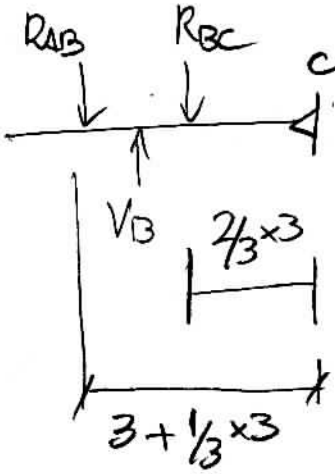
$$Q_{AB}(x) = -\int q_{AB}(x_1)\,dx = -\frac{4x_1^2}{2} + C_1 = -2x_1^2 + C_1$$

como $Q_{AB}(x_1 = 0) = 0$ $\quad C_1 = 0$ $\quad \underline{Q_{AB}(x) = -2x_1^2}$

$$M_{AB}(x) = \int Q_{AB}(x_1)\,dx = -\frac{2x_1^3}{3} + C_2$$

como $M_{AB}(x = 0) = 0$ $\quad C_2 = 0$ $\quad \underline{M_{AB}(x) = -\frac{2}{3}x_1^3}$

Reação V_B: $\quad R_{AB} = 12\,kN/m \times 3m \times \frac{1}{2} = 18\,kN = R_{BC}$



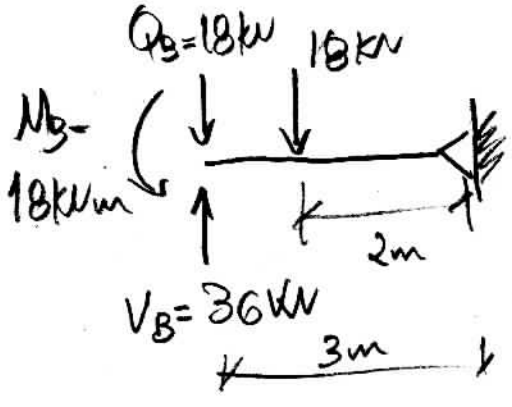
$\circlearrowleft \Sigma M_C = 0 \quad V_B \times 3 - R_{AB} \times 4 - R_{BC} \times 2 = 0$

$$V_B = \frac{1}{3}(4R_{AB} + 2R_{BC})$$

$$V_B = \frac{1}{3}(4 \cdot 18 + 2 \cdot 18) = 36\,kN$$

$\uparrow \Sigma V = 0 \quad \underline{V_C = 0}$

$$M_B = -18\,kN \times 1\,m = -18\,kN\,m$$



$$Q_{BC}(x_2) = -\int q_{BC}(x_2)\,dx$$

$$Q_{BC}(x_2) = +2x_2^2 - 12x + C_1$$

Como $Q_{BC}(x_2 = 0) = 36 - 18 = 18\,kN$

$C_1 = 18$

$Q_{BC}(x_2) = 2x_2^2 - 12x + 18$

$M_{BC}(x_2) = \int Q_{BC}(x_2)\,dx$

$M_{BC}(x_2) = \frac{2}{3}x_2^3 - 6x_2^2 + 18x_2 + C_2$

Como $M_{BC}(x_2 = 3) = 0$

$\frac{2}{3} \times 3^3 - 6 \cdot 3^2 + 18 \cdot 3 + C_2 = 0$

$C_2 = -18$

$M_{BC}(x_2) = \frac{2}{3}x_2^3 - 6x_2^2 + 18x_2 - 18$