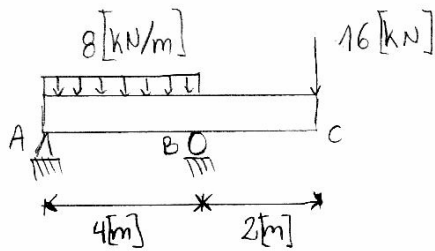


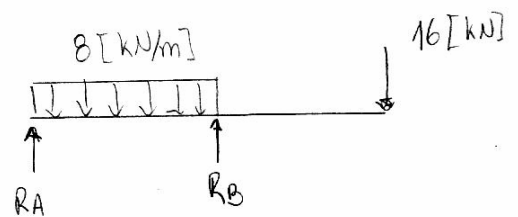
**Pauta ejercicio 1**

P11



1) Cálculo de reacciones

dc|:



•  $\sum F_y = 0$

$\Rightarrow R_A + R_B = 8 \text{ [kN/m]} \cdot 4 \text{ [m]} + 16 \text{ [kN]}$

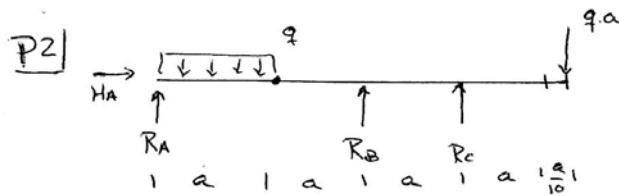
$R_A + R_B = 48 \text{ [kN]} \quad (1)$

•  $\sum M_A = 0$

$\Rightarrow R_B \cdot 4 \text{ [m]} = 8 \text{ [kN/m]} \cdot 4 \text{ [m]} \cdot 2 \text{ [m]} + 16 \text{ [kN]} \cdot 6 \text{ [m]}$

$\Rightarrow \boxed{R_B = 40 \text{ [kN]}} \quad (2)$

$(2) \text{ en } (1) \Rightarrow \boxed{R_A = 8 \text{ [kN]}}$



$$\sum F_x = 0$$

$$\Rightarrow H_A = 0$$

$$\sum F_y = 0$$

$$\Rightarrow R_A + R_B + R_C = q \cdot a + qa$$

$$\{ R_A + R_B + R_C = 2qa \} \quad (1)$$

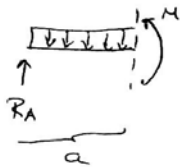
$$\sum M_B = 0 \Rightarrow R_C \cdot a - q \cdot a \left\{ 2a + \frac{a}{10} \right\} + q \cdot a \left\{ a + \frac{a}{2} \right\} - R_A \cdot 2a = 0$$

$$R_C \cdot a - q \cdot a \cdot \frac{21a}{10} + q \cdot a \cdot \frac{3a}{2} - R_A \cdot 2a = 0$$

$$R_C \cdot a - \frac{3qa^2}{5} - R_A \cdot 2a = 0$$

$$\{ R_C = R_A \cdot 2 + \frac{3qa}{5} \} \quad (2)$$

De la sumatoria de momentos internos en la bisagra tenemos:



$$\sum M_C = 0 \Rightarrow M = R_A \cdot a - \frac{q \cdot a^2}{2}$$

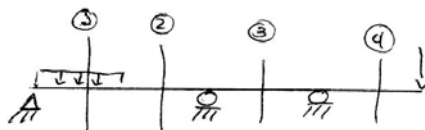
peso en una bisagra  $M = 0$

$$\Rightarrow \{ R_A = \frac{qa}{2} \} \quad (3)$$

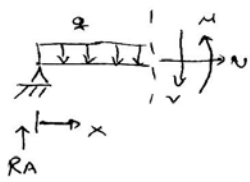
$$(3) \text{ en } (2) \Rightarrow R_C = q \cdot a + \frac{3qa}{5} \Rightarrow R_C = \frac{8qa}{5}$$

$$(3) \text{ y } (2) \text{ en } (1) \Rightarrow \frac{qa}{2} + \frac{8qa}{5} + R_B = 2qa \Rightarrow R_B = -\frac{7 \cdot a}{20}$$

en este caso tenemos que hacer 4 cortes.



①

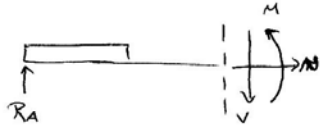


$$\sum F_x = 0 \Rightarrow N = 0$$

$$\sum F_y = 0 \Rightarrow V = R_A - qx$$

$$\sum M_c = 0 \Rightarrow M = R_A x - \frac{qx^2}{2}$$

②

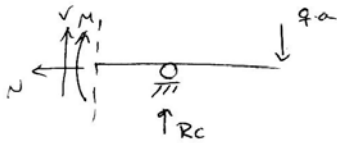


$$\sum F = 0 \Rightarrow N = 0$$

$$\sum F_y = 0 \Rightarrow R_A - q \cdot a = V$$

$$\sum M_c = 0 \Rightarrow M = R_A x - q \cdot a \left(x - \frac{a}{2}\right)$$

③



$$\sum F_x = 0 \Rightarrow N = 0$$

$$\sum F_y = 0 \Rightarrow V = q \cdot a - R_C$$

$$\sum M_c = 0 \Rightarrow M = R_C (2a - x) - q \cdot a \left(\frac{4a}{10} - x\right)$$

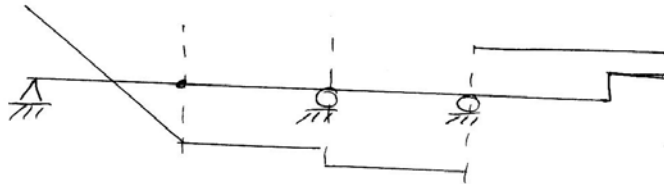
④



$$\sum F_x = 0 \Rightarrow N = 0$$

$$\sum F_y = 0 \Rightarrow V = q \cdot a$$

$$\sum M_c = 0 \Rightarrow M = -q \cdot a \left(\frac{4a}{10} - x\right)$$

diagrama  
de corte.diagrama  
de moment.