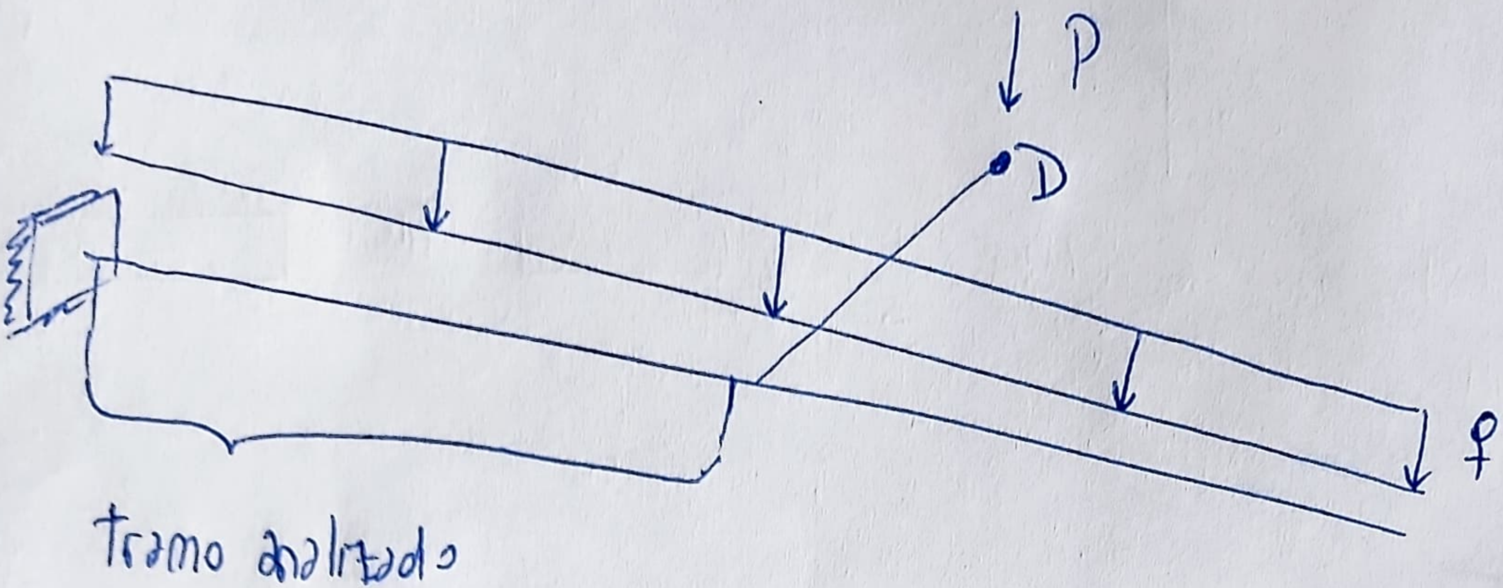

P
D
q
tramo analizado

M_{DV}

Método 1

$q = 1{,}5 \frac{kN}{m}$

$P = 5kN$

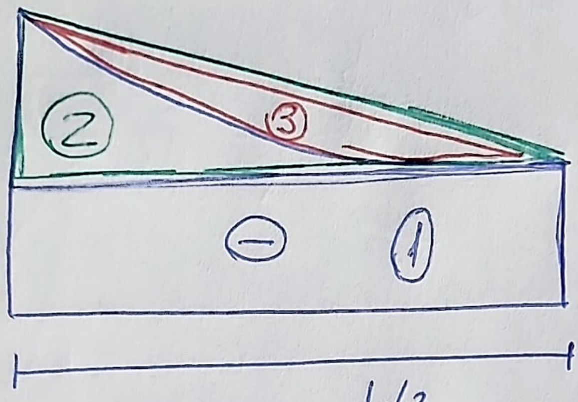
$L = 6m$

$E = 20000 \, kN/cm^2$

$J = 15707 \, cm^4$

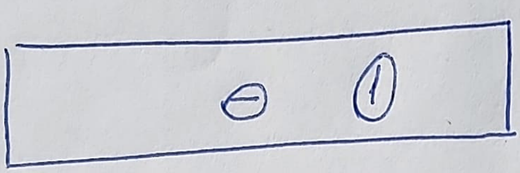
$EJ = 31414 \, kNm^2$

$-qL\frac{L}{2} - P\frac{L}{2}$ (42 kNm)



$-q\frac{L}{2}\frac{L}{4}$ (6,75 kNm)

=

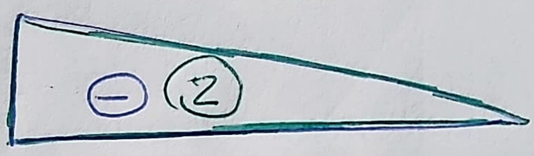


$-q\frac{L}{2}\frac{L}{4}$ (6,75 kNm)

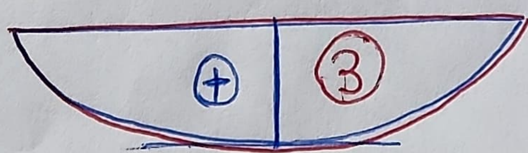
+

$-q\frac{L}{2}\frac{L}{2} - P\frac{L}{2}$

$-q\frac{L}{2}\frac{L}{4}$ (35,25 kNm)

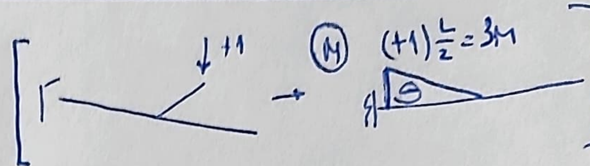


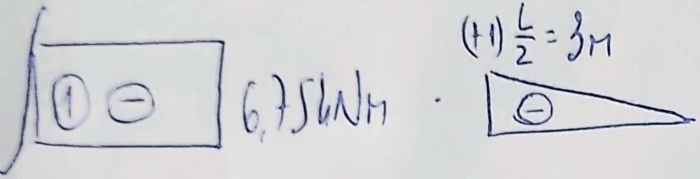
+



$\frac{q\left(\frac{L}{2}\right)^2}{8}$ (1,6875 kNm)

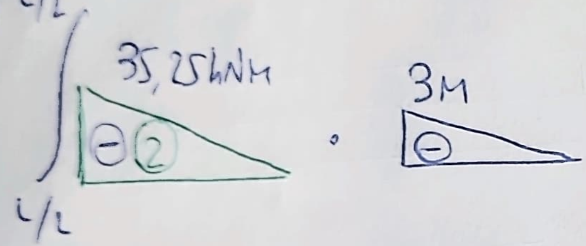
Integración Método ① con Ⓜ en SE





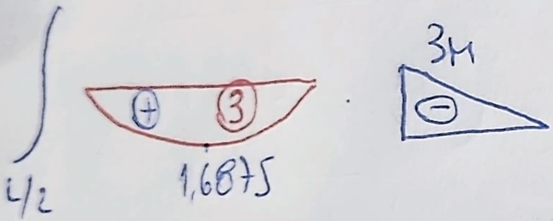
$dx = \frac{1}{2}\cdot\frac{6{,}75\,kNm\cdot 3M\cdot 3M}{EJ} = \oplus 0{,}97\,mm$

$+$



$dx = \frac{1}{3}\cdot\frac{35{,}25\,kNm\cdot 3M\cdot 3M}{EJ} = \oplus 3{,}37\,mm$

$+$

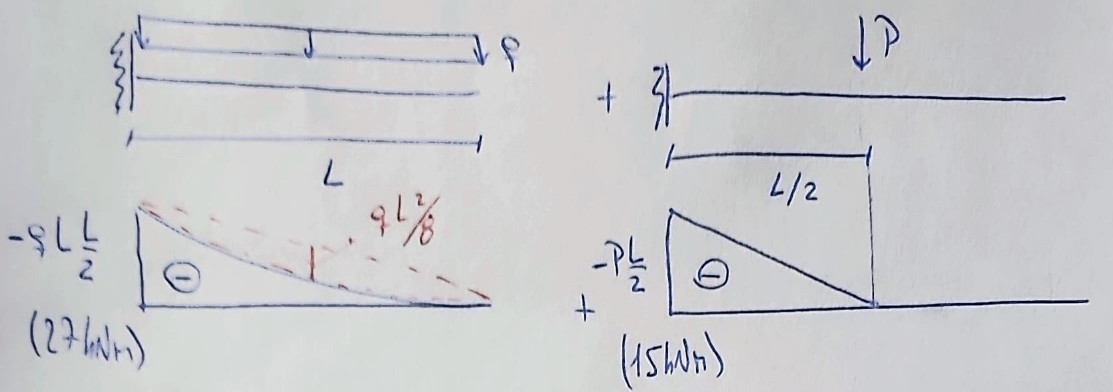


$dx = \frac{1}{3}\cdot\frac{1{,}6875\,kNm\cdot 3M\cdot 3M}{EJ} = \ominus 0{,}16\,mm$

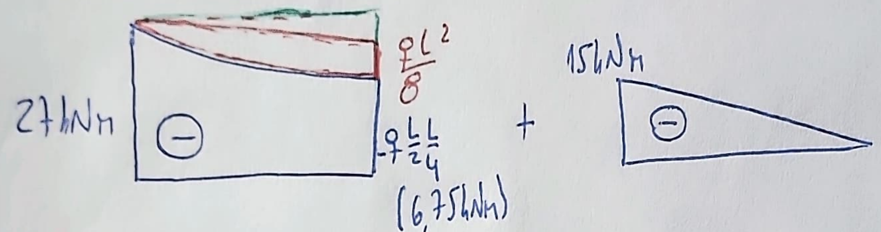
$= 4{,}18\,mm$

Superposición de efectos

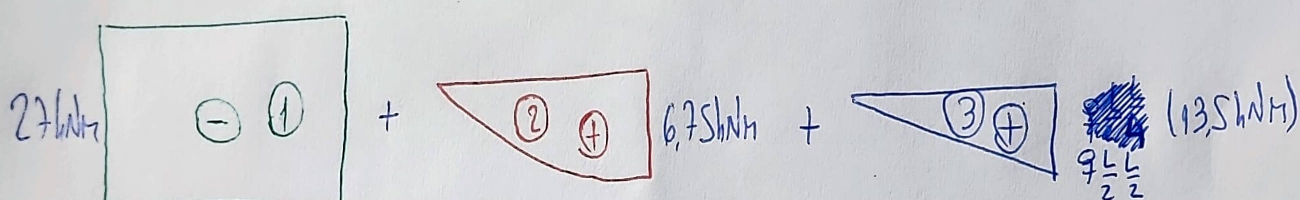
Método 2



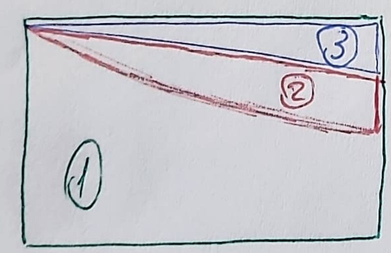
Si vemos media barra:



Podemos descomponer el primero (de la ~~iz~~ izquierda) en:



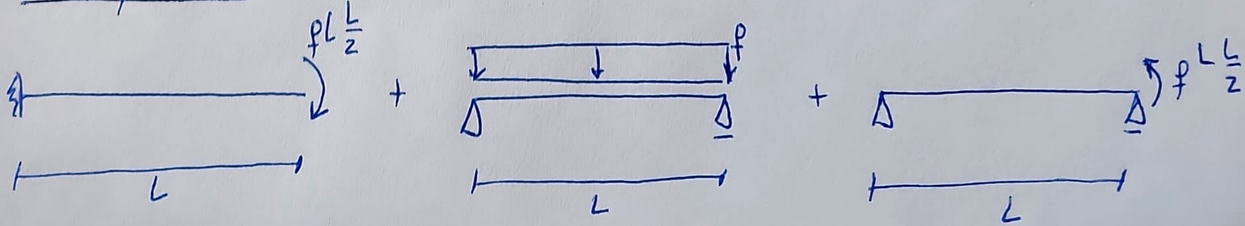
Repasemos a qué corresponde cada uno:



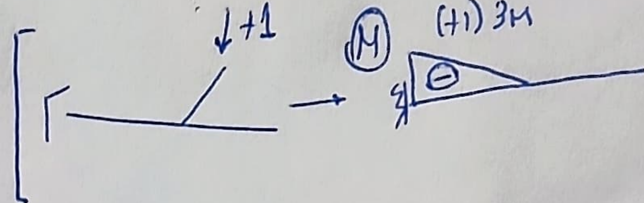
Vemos que los valores en los extremos coinciden.

Además, cada una de esas figuras las podemos encontrar en tablas de integración

Sería equivalente a:



Integración Método (2) con (M) en SE



$$\int_{L/2} \boxed{(1)\ \ominus}\ 27\,kNm \cdot \boxed{\ominus}^{3M}\, dx = \frac{1}{2} \cdot \frac{27\,kNm \cdot 3M \cdot 3M}{EJ} = \frac{121{,}5\,kNm^3}{31414\,kNm^2} \overset{\oplus}{=} 3{,}87\ mm$$

$\oplus$

$$\int_{L/2} \boxed{\oplus\ (2)}\ 6{,}75\,kNm \cdot \boxed{\ominus}^{3M}\, dx = \frac{1}{4} \cdot \frac{6{,}75\,kNm \cdot 3M \cdot 3M}{EJ} \overset{\ominus}{=} 0{,}48\ mm$$

$\oplus$

$$\int_{L/2} \boxed{\oplus}\ 13{,}5\,kNm \cdot \boxed{\ominus}^{3M}\, dx = \frac{1}{6} \cdot \frac{13{,}5\,kNm \cdot 3M \cdot 3M}{EJ} \overset{\ominus}{=} 0{,}64\ mm$$

$\oplus$

$$\int_{L/2} \boxed{\ominus}^{15\,kNm} \cdot \boxed{\ominus}^{3M}\, dx = \frac{1}{3} \cdot \frac{15\,kNm \cdot 3M \cdot 3M}{EJ} \overset{\oplus}{=} 1{,}43\ mm$$

= ~~[illegible]~~ 4,18 mm