

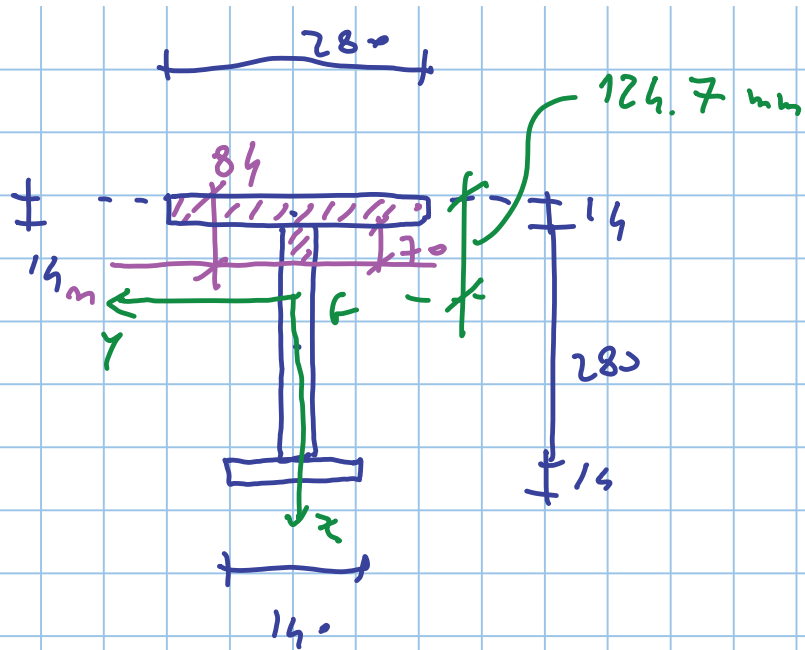
comp.  $\rightarrow$

$$A_1 \cdot 275 + A_2 \cdot 235 = A_3 \cdot 235$$

$$A'_3 \cdot 235 = A_1 \cdot 275 + A'_2 \cdot 235$$

$$A_2 + A_3 = A'_2 + A'_3 = A_{\text{w}}$$

$$A_2 = A'_2 ; A_3 = A'_3$$



$$S_{yy} = 14 \times 280 \times 7 + 14 \times 280 \times (140 + 14) + 14 \times 140 \times (7 + 280 + 14) = 1221080 \text{ mm}^3$$

$$A = 14 \times (280 + 280 + 140) = 9800$$

$$d_{f,y} = \frac{1221080}{9800} = 124.7 \text{ mm}$$

$$A_{1/2} = 14 \times 350$$

$$S_{1/2,yy} = 14 \times 280 \times (124.7 - 7) + 14 \times 70 \times (124.7 - 14 - 35) = 535.1 \times 10^3 \text{ mm}^3$$

↑  
centroidal axis

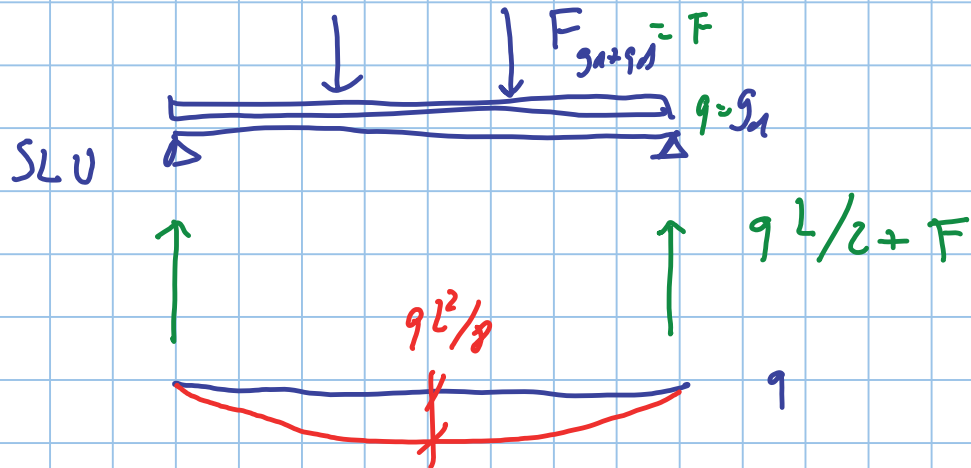
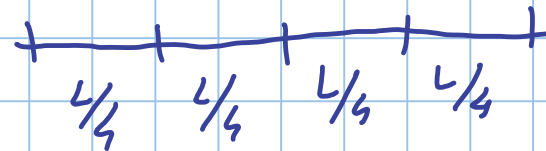
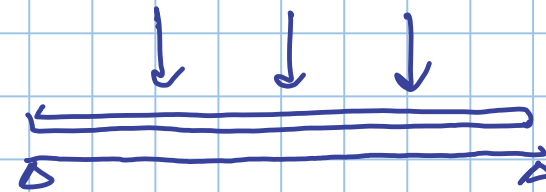
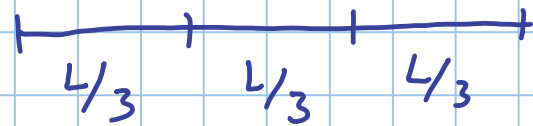
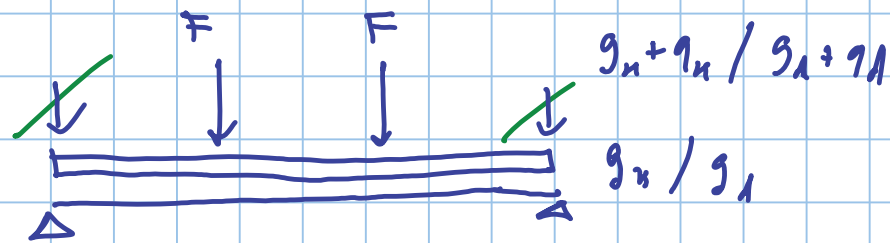
$x$  compress mp

$$c_f = 123$$

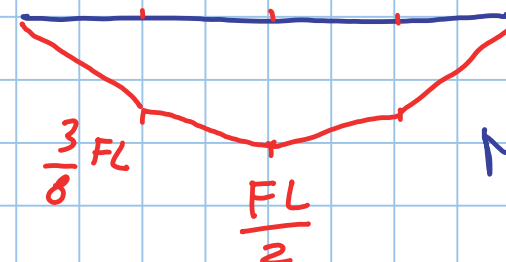
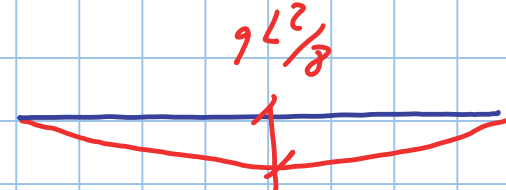
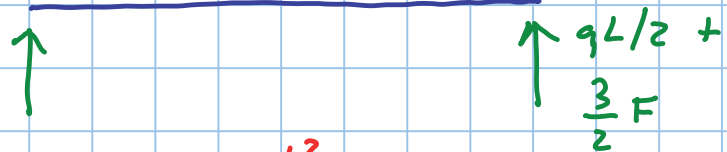
$$\frac{c_f}{t_f} = 8.79$$

limit:	class	1	9 €	8.32	7.32
		2	10 €	9.74	8.14
		3	14 €	12.94	11.39

$x$	S 235	$\epsilon = 1$	class 1	} $W_{pl}$	$M_{pl} = W_{pl} \frac{f_y}{\gamma_{M_0}}$
	S 275	$\epsilon = 0.92$	class 2		
	S 355	$\epsilon = 0.81$	class 3	} $W_{el}$	$M_{pl} = W_{el} \frac{f_y}{\gamma_{M_0}}$

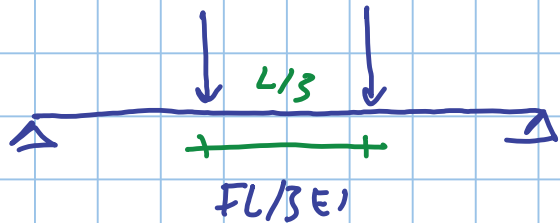


$$M_{Ed} = \frac{qL^2}{8} + \frac{FL}{3}$$

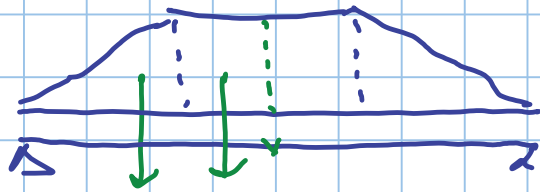


$$M_{Ed} = \frac{qL^2}{8} + \frac{FL}{2}$$

SLE



Mohn



$$\frac{FL^2}{9EI}$$



$$\frac{FL^2}{18EI} \quad \frac{FL^2}{18EI}$$

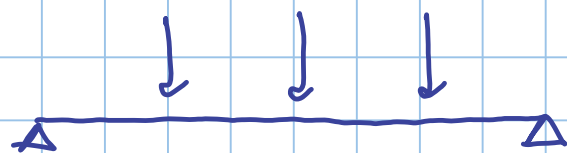
$$L/12$$



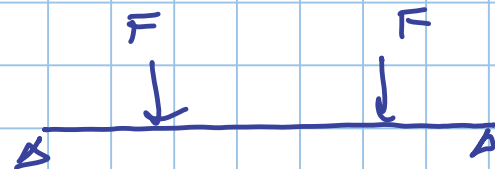
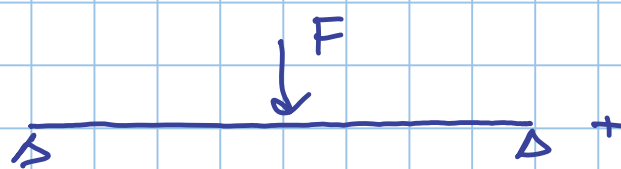
$$L \left( \frac{1}{6} + \frac{1}{3} \right) = \frac{5}{18} L$$

$$M = \frac{FL^2}{9EI} \cdot \frac{L}{2} - \frac{FL^2}{18EI} \cdot \frac{5}{18} L - \frac{FL^2}{18EI} \cdot \frac{L}{12} = \frac{FL^3}{18EI} \left( 1 - \frac{5}{18} - \frac{1}{12} \right) = \frac{FL^3}{18EI} \cdot \frac{36-10-3}{36}$$

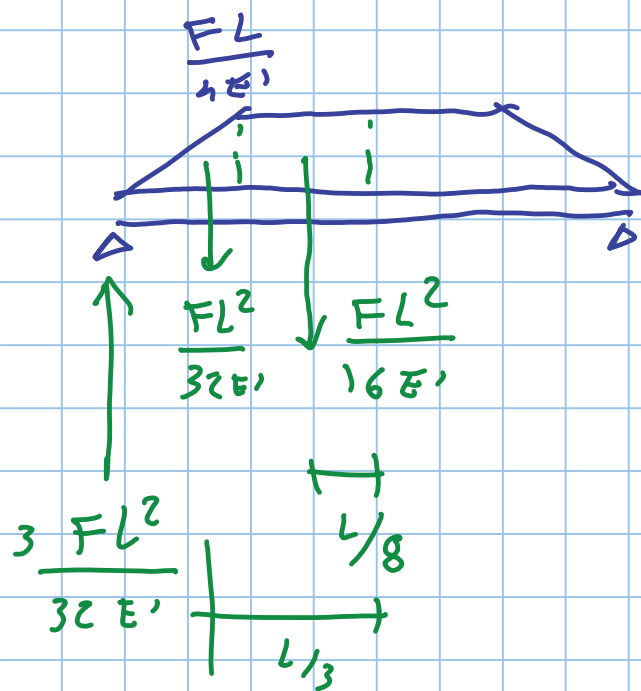
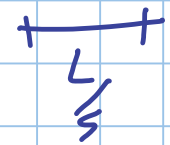
$$f = \frac{23}{648} \frac{FL^3}{EI} \rightarrow \frac{5}{384} \frac{qL^4}{EI}$$



=



$$\delta = \frac{FL^3}{48EI}$$



$$\frac{FL^3}{48EI} + \frac{FL^3}{32EI} \cdot \frac{11}{12} = \frac{FL^3}{48EI} \left( 1 + \frac{11}{8} \right) = \frac{19}{384} \frac{FL^3}{EI}$$

$$f = \frac{19}{384} \frac{FL^3}{EI} + \frac{5}{384} \frac{9L^4}{EI}$$

$$M = \frac{3}{32} \frac{FL^2}{EI} \cdot \frac{L}{2} - \frac{FL^2}{32EI} \cdot \frac{L}{3} - \frac{FL^2}{16EI} \cdot \frac{L}{8} = \frac{FL^3}{32EI} \left( \frac{3}{2} - \frac{1}{3} - \frac{1}{4} \right) = \frac{FL^3}{32EI} \frac{18-4-3}{12}$$