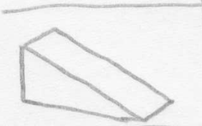
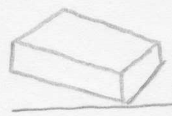
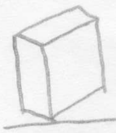
1 CENTRO DE GRAVEDAD DE LA PIEZA $G = (-1.5, Y_G, Z_G)$ POR SIMETRÍA

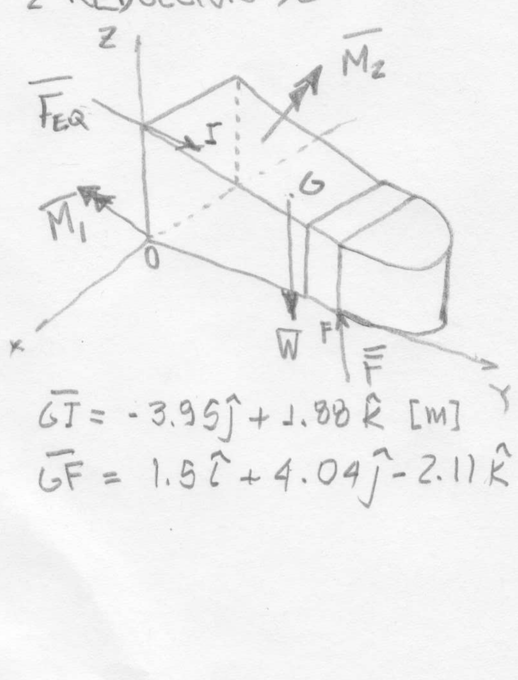
ELEMENTO	Y_G (m)	Z_G (m)	V_i (m^3)	$Y_{Gi}V_i$ (m^4)	$Z_{Gi}V_i$ (m^4)
	2	$3+\frac{1}{3}(3)=4$	$\frac{6\cdot3}{2}\cdot3=27$	54	108
	3	1.5	$6\cdot3\cdot3=54$	162	81
	$6+1=7$	1.5	$2\cdot3\cdot3=18$	126	27
	$8+\frac{4(1.5)}{3\pi}$ $=8.64$	1.5	$\frac{(1.5)^2\pi}{2}\cdot3$ =	91.57	15.90
			109.60	433.57	231.90

$Y_G = \frac{\sum Y_{Gi}V_i}{\sum V_i} = 3.95\,m$

$Z_G = \frac{\sum Z_{Gi}V_i}{\sum V_i} = 2.11\,m$

$G = (-1.5, 3.95, 2.11)$ [m]

2 REDUCCIÓN DEL SISTEMA AL CENTRO DE GRAVEDAD:



$\overline{GI} = -3.95\hat{j} + 1.88\hat{k}$ [m]

$\overline{GF} = 1.5\hat{i} + 4.04\hat{j} - 2.11\hat{k}$ [m]

$\overline{M_1} = 50\hat{i} + 100\hat{j} + 100\hat{k}$ [KN.m]

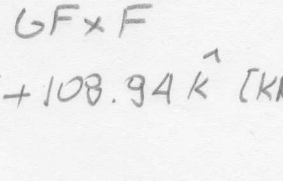
$\overline{F} = 20\hat{k}$ [KN]

$\overline{W} = -(109.60)(80)\hat{k} = -8.768\cdot10^3\hat{k}$ [KN]

$\overline{F_{EQ}} = \frac{30\cdot6}{2}\cdot3\hat{j} = 270\hat{j}$ [KN]

$I = (-1.5, 0, 4)$ [m]

$\tan(\alpha) = \frac{1}{2}$



$\overline{M_2} = M_2(\text{sen}\,\alpha\,\hat{j} + \cos\alpha\,\hat{k})$,

$\overline{M_2} = 4.47\hat{j} + 8.94\hat{k}$ [KN.m]

$\overline{F_R} = 270\hat{j} + (-8.768\cdot10^3 + 20)\hat{k}$

$\overline{F_R} = 270\hat{j} - 8748.23\hat{k}$ [KN]

$\overline{M_G} = \overline{M_1} + \overline{M_2} + \overline{GI}\times\overline{F_{EQ}} + \overline{GF}\times\overline{F}$

$\overline{M_G} = -377.83\hat{i} + 74.47\hat{j} + 108.94\hat{k}$ [KN.m]

- SISTEMA FUERZA-PAR EQUIVALENTE EN G:

$\overline{F}^* = 270\hat{j} - 8748.23\hat{k}$ [KN]

$\overline{M}^* = -377.83\hat{i} + 74.47\hat{j} + 108.94\hat{k}$ [KN.m]