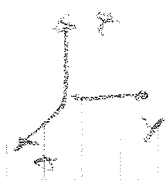
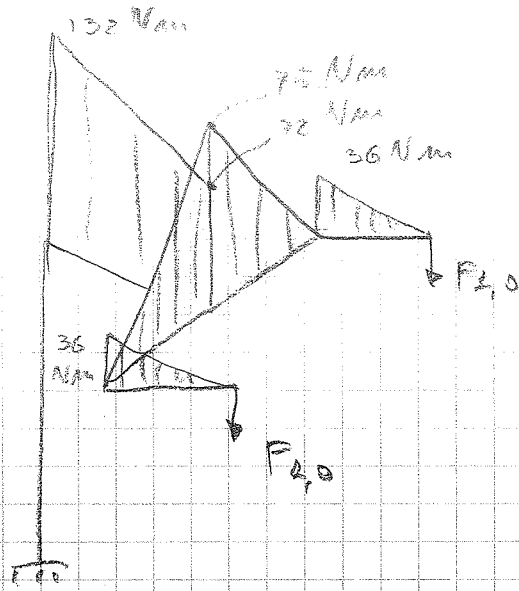
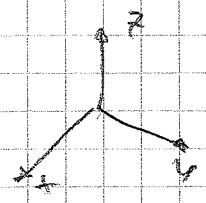
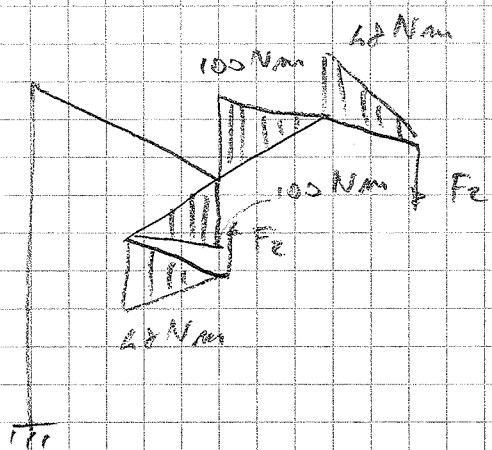


5)



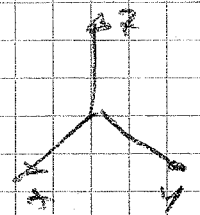
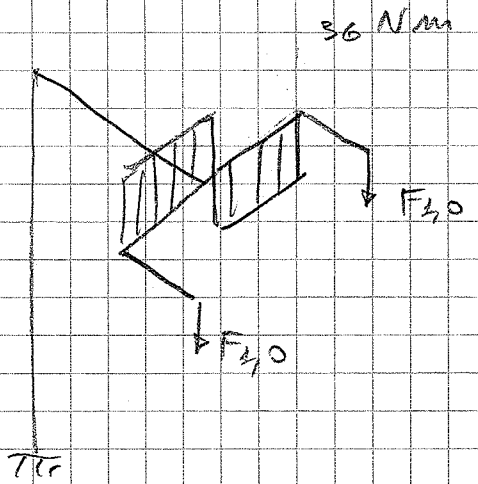
M_0

$F_{2,0}$



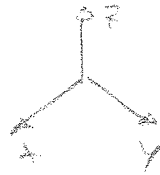
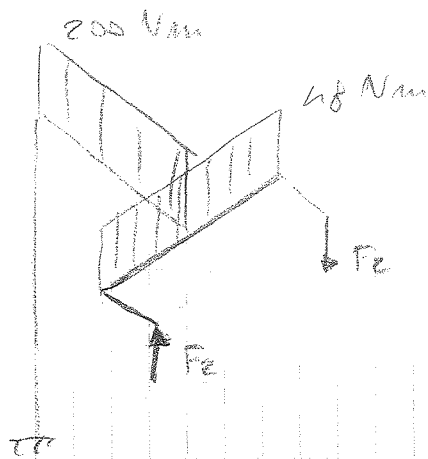
M_0

F_2



M_0

$F_{2,0}$

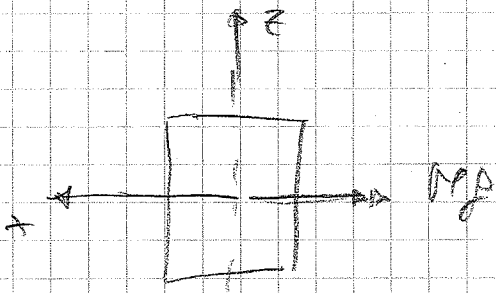


Mb

Fz

2

c) Verifica a fadiga braço b



$$M_b = 2 F_z \cdot 0,220 \text{ em cm} = 132 \text{ em cm [Nm]}$$

Tensão transversal $\sigma \Rightarrow \sigma_{max} = \frac{3}{2} \frac{2 F_z 0}{b^2} = 1,64 \text{ MPa}$

$$\sigma_{max} = \frac{6 M_b}{b h^2} = \frac{6 M_b}{b^3} = 50,7 \text{ MPa}$$

$$\sigma_{max} \leq \frac{\sigma_{L, FAT} b_2 b_3}{k_f b} = \frac{0,5 R_m \cdot b_2 b_3}{k_f b}$$

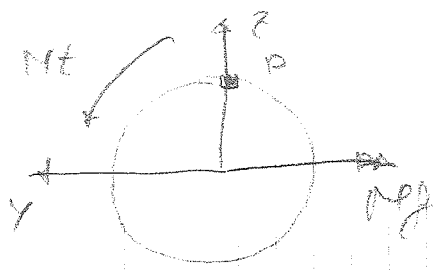
$b_2 = 0,9$, b_3 (rect. fca) = $0,91$

$$k_f = \frac{1}{1 + \frac{0,3 d}{\sqrt{b}}} = 0,79 \Rightarrow k_f = 1 + (k_f - 1) \cdot \frac{1}{b} = 1,39$$

$$50,7 \text{ MPa} \leq \frac{255 \text{ MPa} \cdot 0,9 \cdot 0,91}{1,39 \cdot \frac{1}{b}} = \frac{150,2 \text{ MPa}}{\frac{1}{b}}$$

$\frac{1}{b_{FAT}} = 2,96$

3) $F_{TOT} = F_1 + F_2 = 700 \text{ N}$

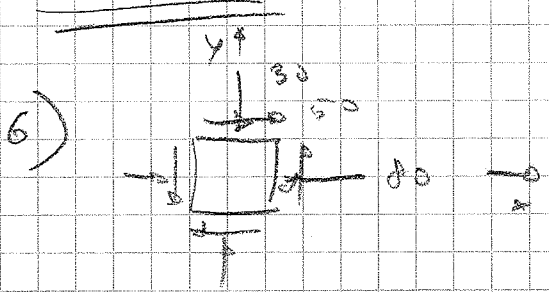


$M_x = F_{TOT} \cdot 120 \text{ mm} = 84 \text{ Nm}$
 $M_y = F_{TOT} \cdot 250 \text{ mm} = 175 \text{ Nm}$

$\sigma_{MAX} = \frac{32 M_y}{\pi D^3} = \frac{32 \cdot 175000}{\pi \cdot 25^3} = 114 \text{ MPa}$
 $\tau_{MAX} = \frac{16 M_x}{\pi D^3} = \frac{16 \cdot 84000}{\pi \cdot 25^3} = 27,4 \text{ MPa}$ } Punto P

$\sigma_{VM}^* = \sqrt{\sigma_{MAX}^2 + 3\tau_{MAX}^2} = 123,5 \text{ MPa} \leq \frac{R_{p0,2}}{\gamma_{ST}} = \frac{360}{\gamma_{ST}} \text{ MPa}$

$\gamma_{ST} = 2,92$



$\sigma_{xx} = -20 \text{ MPa}$
 $\sigma_{yy} = -30 \text{ MPa}$
 $\tau_{xy} = 50 \text{ MPa}$

Stato piano di sforzo

$$\begin{vmatrix} \sigma_{xx} - \sigma_p & \tau_{xy} \\ \tau_{yx} & \sigma_{yy} - \sigma_p \end{vmatrix} = 0$$

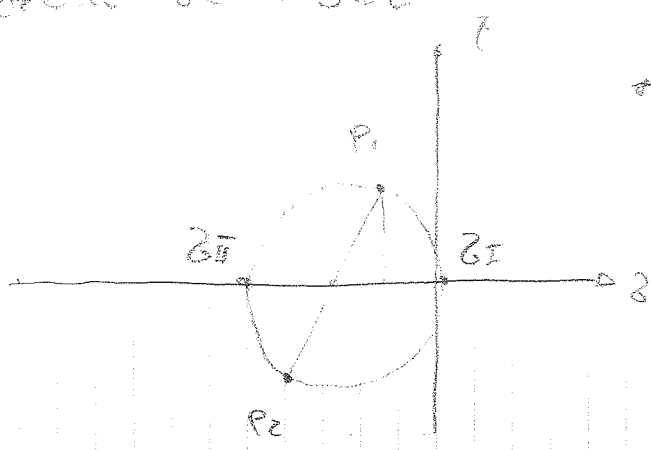
$(-20 - \sigma_p)(-30 - \sigma_p) - 50^2 = 0$

$\sigma_p^2 + \sigma_p(20 + 30) + 2400 - 2500 = 0$

$\sigma_p^2 + 110\sigma_p - 100 = 0$

$\sigma_p = -55 \pm \sqrt{55^2 + 100} = -55 \pm 55,9 = \begin{cases} 110,9 \text{ MPa} = \sigma_I \\ +0,9 \text{ MPa} = \sigma_{II} \end{cases}$

Caractéris de Molsve



$$P_1 (-30, +50), P_2 (-30, -50)$$

$$z_{II} = z_{MED} + R = -55 + \sqrt{25^2 + 30^2} = 0,9 \text{ MPa}$$

$$z_{I} = z_{MED} - R = -110,9 \text{ MPa}$$