Master1 Construction

MMC

Correction

Exo 02) : 8pts

$$\begin{cases} \sigma_x = 145\ MPa \\ \sigma_y = 95\ MPa \\ \sigma_z = 0 \\ \tau_{xy} = 42 \\ \varepsilon_z = -3.6.10^{-4} \end{cases}$$

$$\begin{cases} \gamma_{xy} = \frac{1}{G}\tau_{xy} = 7.69.10^{-4} \\ \gamma_{yz} = \frac{1}{G}\tau_{yz} = 0 \\ \gamma_{zx} = \frac{1}{G}\tau_{zx} = 0 \end{cases}$$

$$\begin{cases} \varepsilon_x = \frac{1}{E}\left[\sigma_x - \nu(\sigma_y - \sigma_z)\right] = \frac{1}{200} - \frac{0.35}{95} = 5.82.10^{-4} \\ \varepsilon_y = \frac{1}{E}\left[\sigma_y - \nu(\sigma_y + \sigma_z)\right] = 2.57.10^{-4} \\ \sigma_y = \left[-\sigma_x - \frac{E}{\nu}(\varepsilon_z)\right] \end{cases}$$

Allongement linéaire dans la direction $\left(\frac{1}{2} \quad \frac{\sqrt{3}}{2} \quad 0\right)$

- $\varepsilon_A = l^2.\varepsilon_x + m^2.\varepsilon_y + n^2.\varepsilon_z + l.m.\gamma_{xy} + m.n.\gamma_{yz} + n.l.\gamma_{zx} = 6.71$

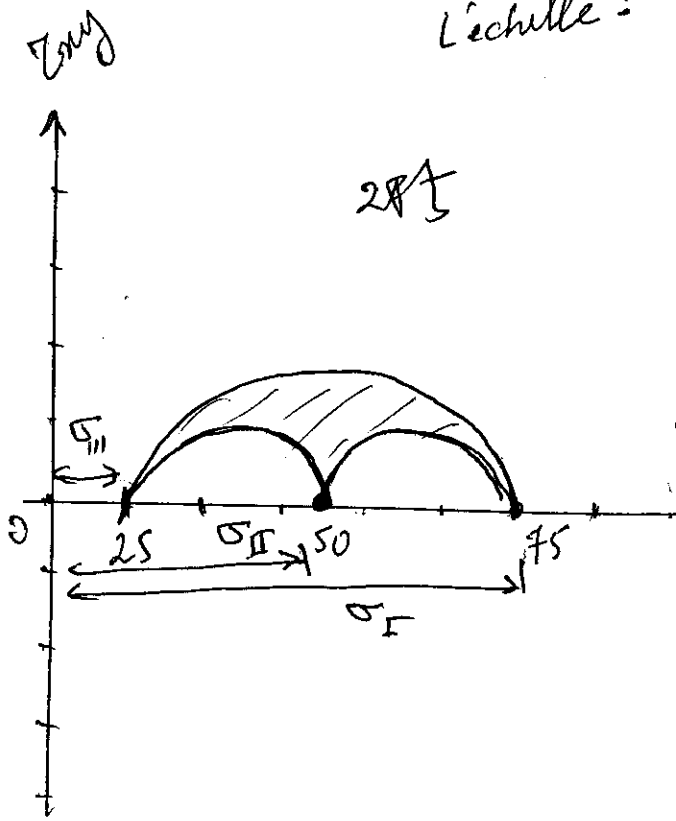
Exo 01) : 6pts

- *On a* $\delta_{ijpq} = \delta_{ip}.\delta_{jq} - \delta_{iq}.\delta_{jp}$
  $\Rightarrow \delta_{ijpq} = \delta_{ip}.\delta_{jj} - \delta_{jq}.\delta_{ij} = 3\delta_{ip} - \delta_{ip}$
- $\varepsilon_{ijk}.A_jB_k = \varepsilon_{ikj}.A_kB_j = -\varepsilon_{ijk}A_kB_j = -\varepsilon_{ijk}B_jA_k = -(\vec{B} \wedge \vec{A})$

Exo 03) : 6pts

$\sigma_1 = 75$, $\sigma_2 = 50$, $\sigma_3 = 25$

$\overrightarrow{n_1} = \begin{pmatrix} \pm\frac{4}{5} \\ 0 \\ \pm\frac{3}{5} \end{pmatrix}$ $\overrightarrow{n_1} = \begin{pmatrix} 0 \\ \pm 1 \\ 0 \end{pmatrix}$ $\overrightarrow{n_1} = \begin{pmatrix} \pm\frac{3}{5} \\ 0 \\ \pm\frac{4}{5} \end{pmatrix}$



L'échelle :

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