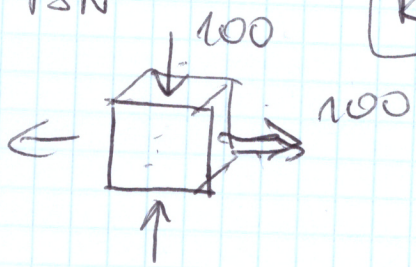
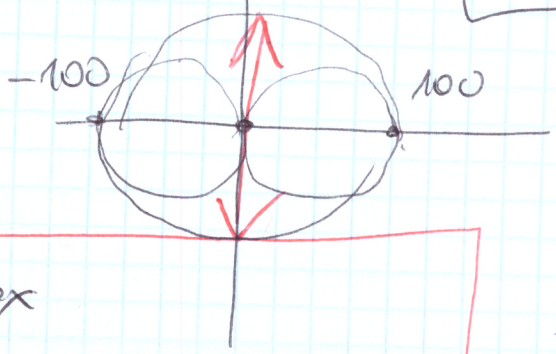
23) PSN



$R_e = 280\ MPa$

$n_e = ?$



б)

$$n_e < \frac{R_e}{k_r}$$

$$\sigma^{T}_{red} = 2\tau_{max}$$

$$\sigma^{T}_{red} = 100 - (-100) = 200\ MPa$$

sken zost.

$$\rightarrow n_e = \frac{280}{200} =$$

$$n_e = 1{,}4$$

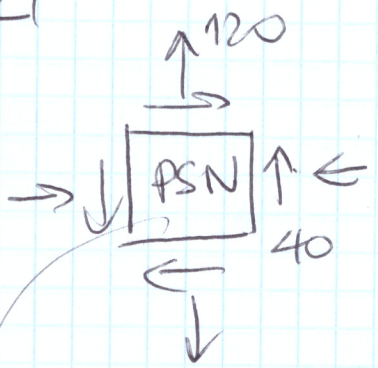
$$\sigma^{H}_{red} = \sqrt{\frac{1}{2}\left[(100+100)^2 + (-100-0)^2 + (0-100)^2\right]}$$

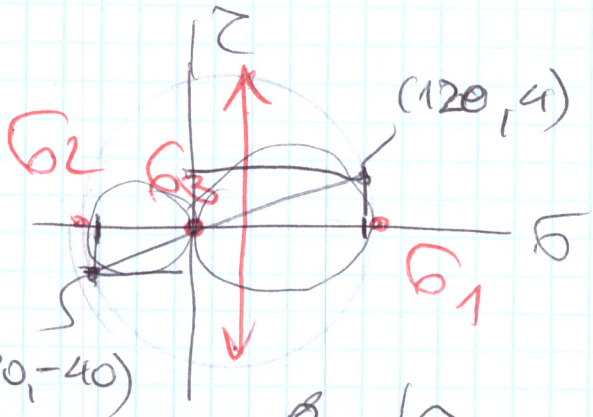
$$\frac{1}{2}\left[200^2 + 100^2 + 100^2\right]$$

$$\sigma^{H}_{red} = 173\ MPa$$

$$n_e = \frac{280}{173} = 1{,}62$$

24|





R $\tau_{max} = 108$ MPa

$\sigma^T_{red} = 2\tau_{max}$

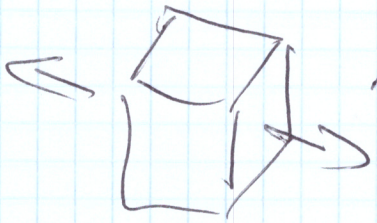
$\sigma^T_{red} = 216$ MPa

Huber.

$$\sigma^H_{red} = \sqrt{\frac{1}{2}\left[(-80-120)^2 + (120-0)^2 + (0+80)^2\right] + 3\cdot 40^2}$$

200^2 120^2 80^2

$\sigma^H_{red} = 188$ MPa



$R_e = 300$

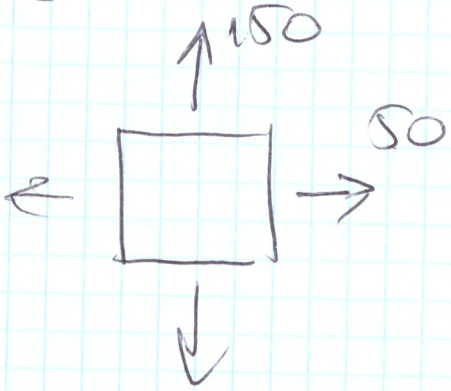
$n_e = 2$

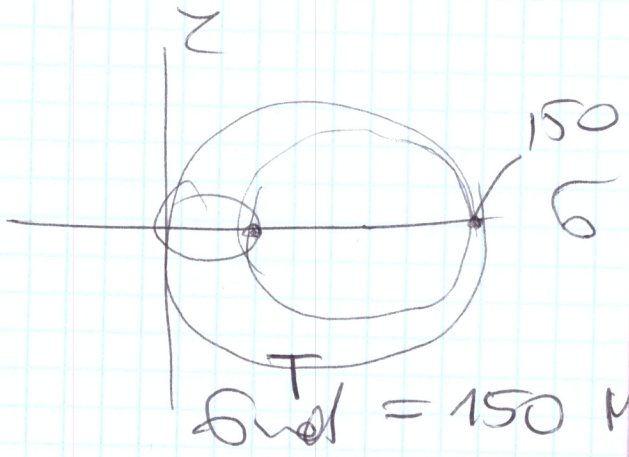
$k_r = \frac{300}{2} = 150$ MPa

Nie jest bezp.!

bo $\sigma_{red} > k_r$!

Z5



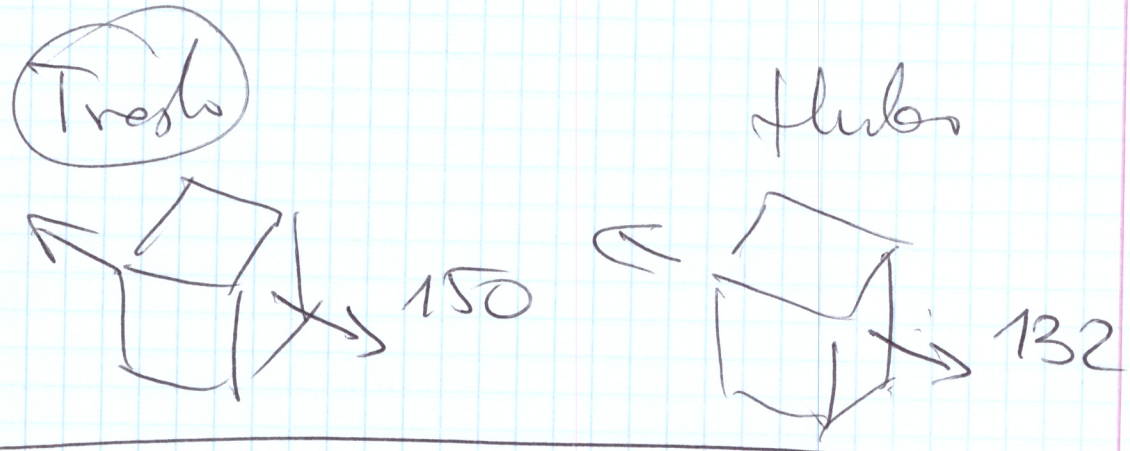


$\sigma_{red} = 150\ MPa$

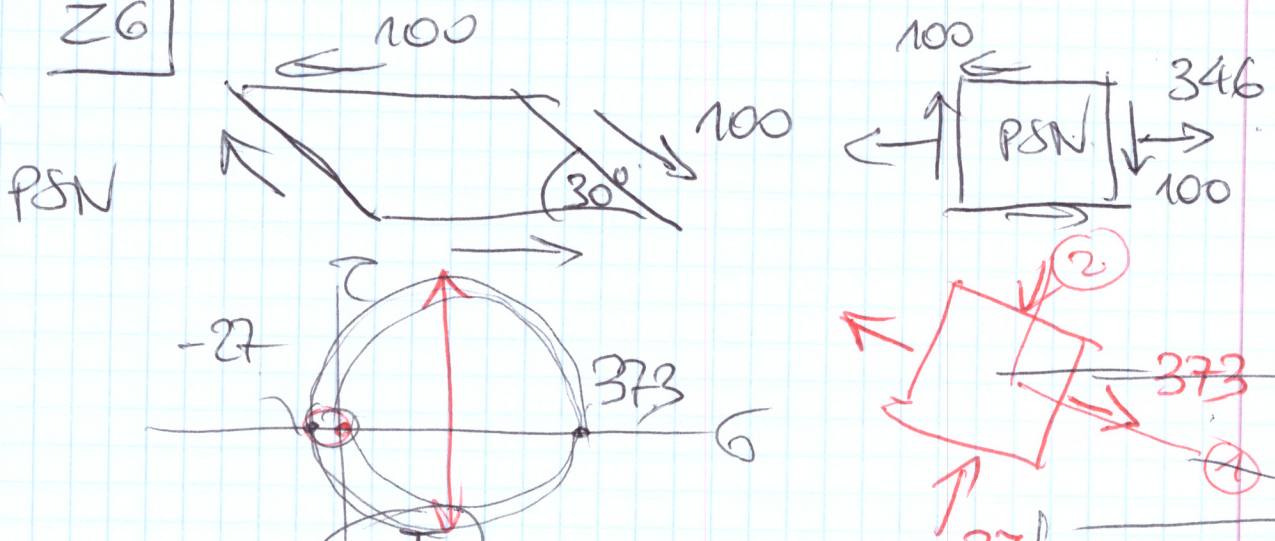
$$\sigma^{H}_{red} = \sqrt{\frac{1}{2}\left[(50-150)^2 + (150-0)^2 + (0-50)^2\right]}$$

$100^2 \quad 150^2 \quad 50^2$

$$\sigma^{H}_{red} = 132\ MPa$$



Z6

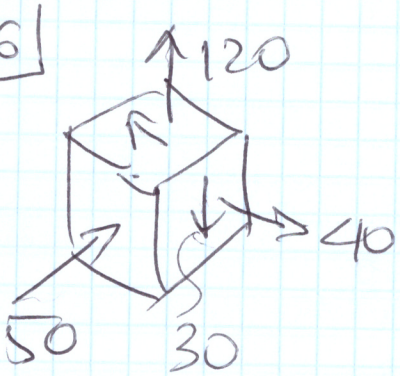


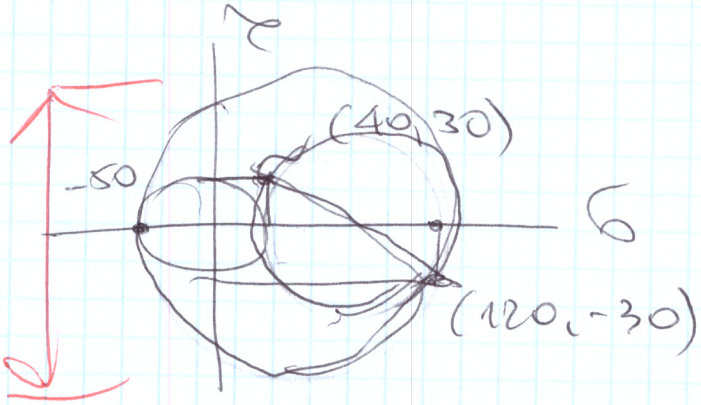
$\sigma_{red} = 373 + 27 = 400\ MPa$ ⟵□⟶ 400

$$\sigma^{H}_{red} = \sqrt{\frac{1}{2}\left[(346-0)^2 + (0-0)^2 + (0-346)^2\right] + 3\cdot 100^2}$$

$$\sigma^{H}_{red} = 387\ MPa$$

26)





$\tau_{max} = 90$

$\sigma^{T}_{red} = 180$ MPa

$$\sigma^{H}_{red} = \sqrt{\frac{1}{2}\left[(40-120)^2+(120+50)^2+(-50-40)^2\right]+3\cdot 30^2}$$

$\sigma^{H}_{red} = 156$ MPa