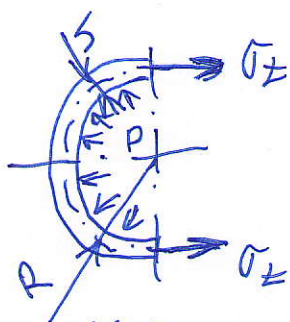


Pr.: Porovnejte napětí v kulové a válcové skořepině zatížené vnitřním tlakem. Dáno:  $p, d, h$   $d \gg h$ ;  $d = 2R$



délka skořepiny...  $l$

Válcová skořepina:

$$\boxed{SR}: \sigma_z \cdot 2 \cdot h \cdot l - p \cdot 2R \cdot l = 0$$

$$\underline{\underline{\sigma_z = \frac{pR}{h}}}$$

Nyní za pomoci Laplaceovy rovnice:

$$0 = \frac{\sigma_m}{R_m} + \frac{\sigma_z}{R_z} = \frac{p}{h}$$

$$R_m = \infty; R_z = R$$

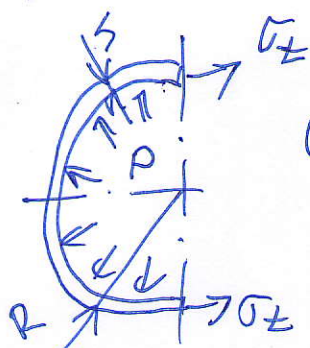
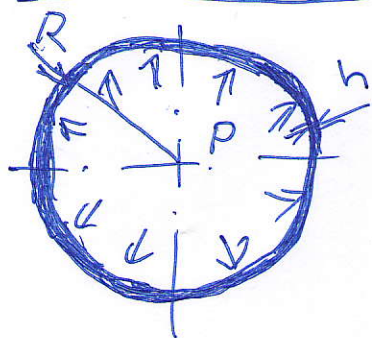
$$\Rightarrow \underline{\underline{\sigma_z = \frac{pR}{h}}}$$

$$\sigma_m \sim p \sim 0$$

$$0 < \sigma_z < \sigma_z$$

$$\underline{\underline{\sigma_{rad} = \sigma_z - (-p)}}$$

Kulová skořepina



$\boxed{SR}$

$$\sigma_z \cdot 2\pi R \cdot h - p \cdot \pi R^2 = 0$$

$$\underline{\underline{\sigma_z = \frac{pR}{2h}}}$$

... a z Laplaceovy rovnice:

$$\frac{\sigma_m}{R_m} + \frac{\sigma_z}{R_z} = \frac{p}{h}$$

$$R_m = R_z = R; \sigma_m = \sigma_z$$

$$\frac{\sigma_z}{R} + \frac{\sigma_z}{R} = \frac{p}{h} \Rightarrow \underline{\underline{\sigma_z = \frac{pR}{2h}}}$$

Pozn.:  $\sigma_m \sim p \sim 0$ ;  $\sigma_{rad} = \sigma_1 - \sigma_3 = \sigma_z - (-p) = \underline{\underline{\frac{pR}{2h} + p}}$