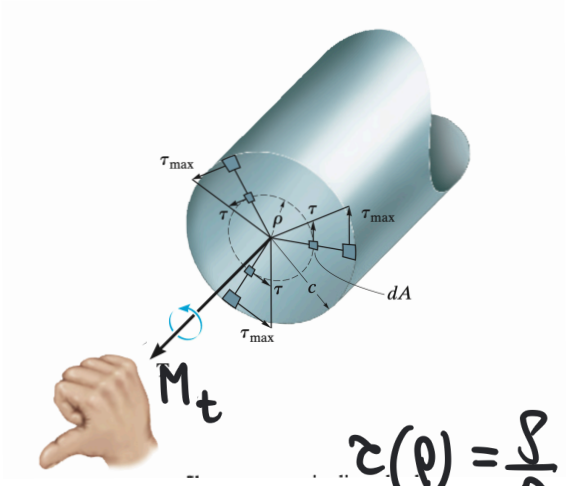
TORSIONE DI BARRE A SEZIONE CIRCOLARE



- Le tensioni tangenziali sono perpendicolari alla direzione radiale
- La loro intensità è proporzionale alla distanza dal centro.

$$\tau(\rho) = \frac{\rho}{R}\tau_{max}$$

$$dM_t = \tau\, 2\pi\rho\, d\rho = \tau_{max}\frac{2\pi\rho^2}{R}d\rho$$

$$M_t = \int dM = \frac{2\pi}{R}\tau_{max}\int_0^R \rho^2 d\rho =$$

$$= \frac{\tau_{max}}{R} I_p = I_p \frac{\tau(\rho)}{\rho}$$

$$2\pi\int_0^R \rho^2 d\rho = I_p$$

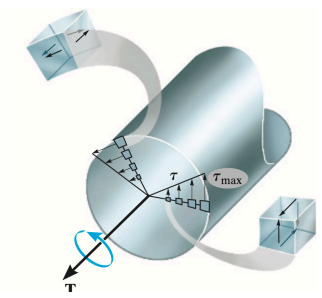
momento d'inerzia polare

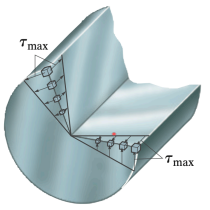
$$\boxed{\tau(\rho) = \rho\frac{M_t}{I_p}}$$

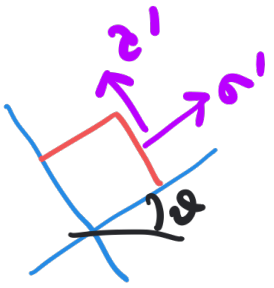
Rif: Casini-Vasta eq. (20.14)

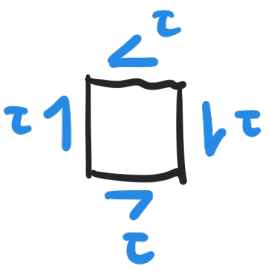
Hibbeler eq. (9.6).

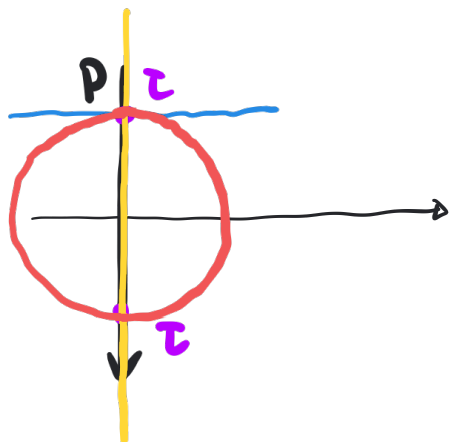
STATO TENSIONALE IN UNA BARRA DI TORSIONE

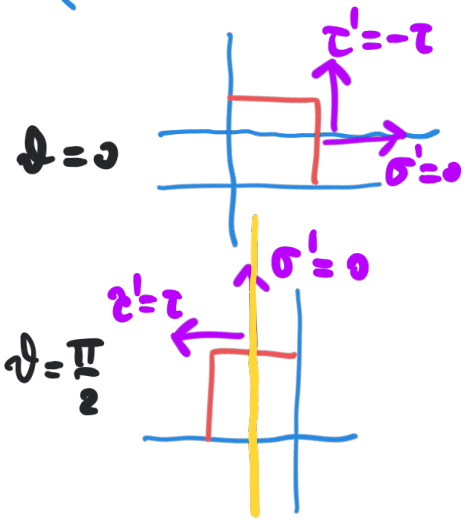




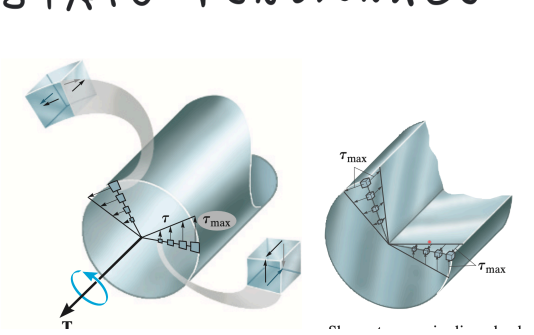




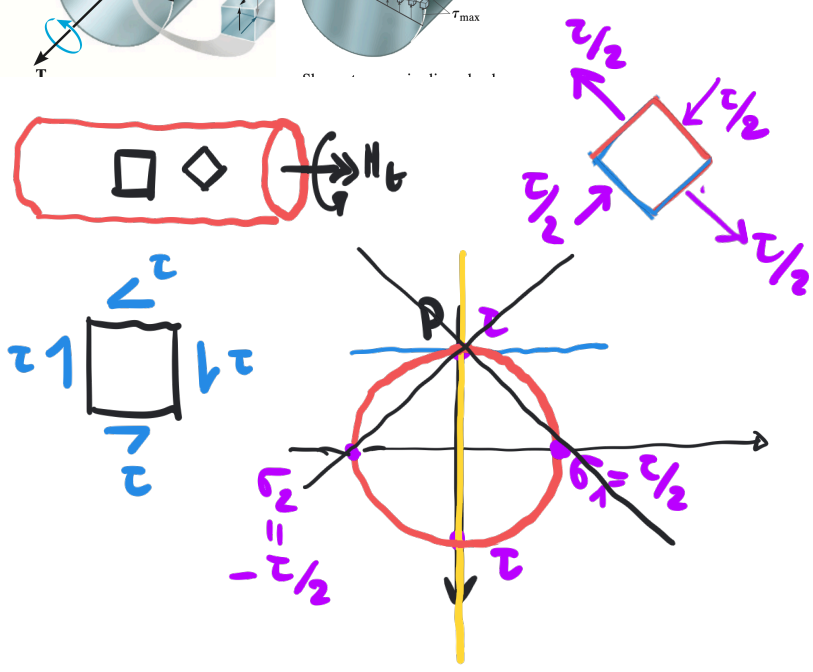


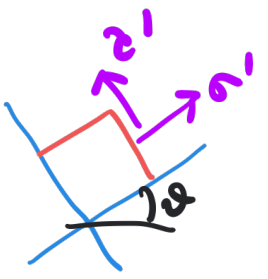


STATO TENSIONALE IN UNA BARRA DI TORSIONE



$\vartheta = 0 \quad \tau' = 0 \quad \sigma' = -\tau/2$

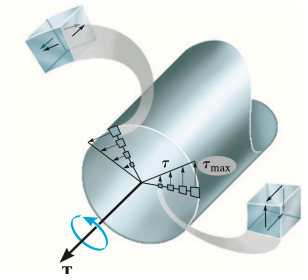


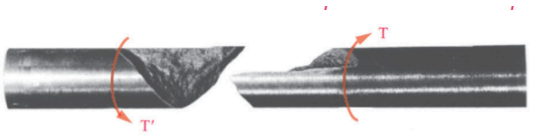


$\vartheta = 0 \quad \tau' = -\tau \quad \sigma' = 0$

$\vartheta = \frac{\pi}{2} \quad \sigma' = 0 \quad \tau' = \tau$

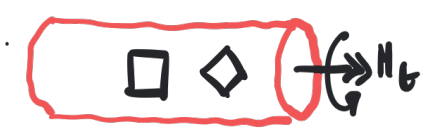
STATO TENSIONALE IN UNA BARRA DI TORSIONE

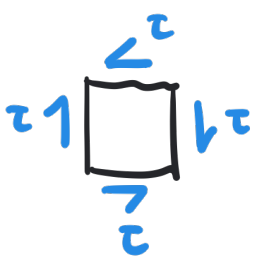


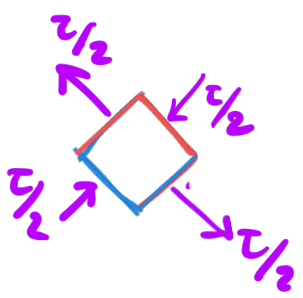


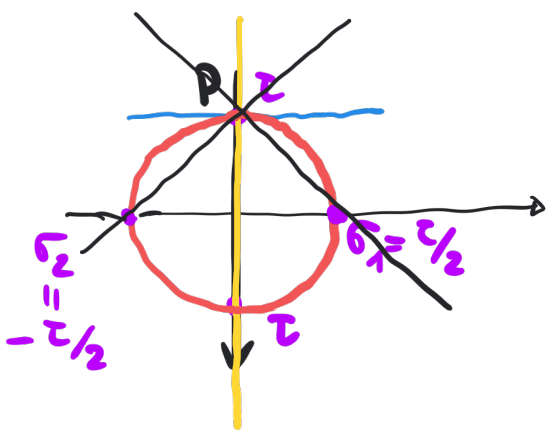
(b) Brittle Failure

Failure of a wooden shaft due to torsion.









Sezioni cave