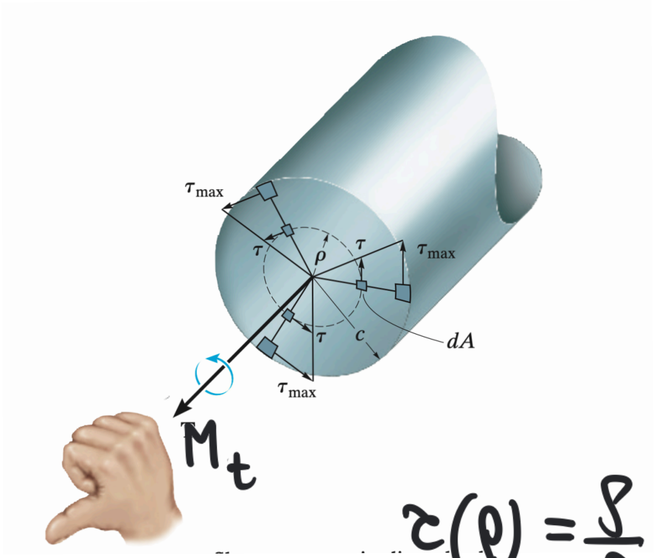
TORSIONE DI BARRE A SEZIONE CIRCOLARE



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

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

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

momento d'inerzia polare

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

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

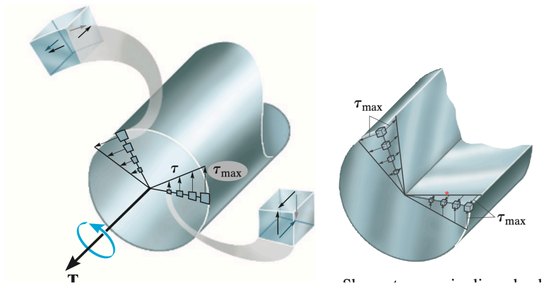
$$= \frac{\tau_{max}}{R}I_p = I_p\frac{\tau(\rho)}{\rho}$$

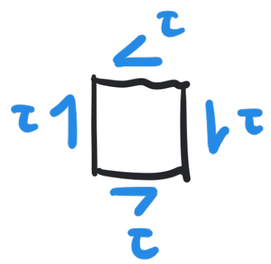
$$\boxed{\tau(\rho) = \rho\frac{M_t}{I_p}}$$

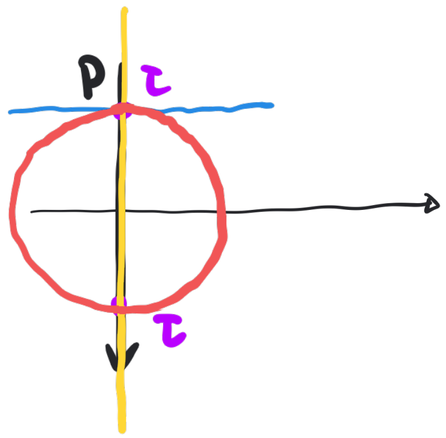
Rif: Casini-Vasta eq. (20.14)

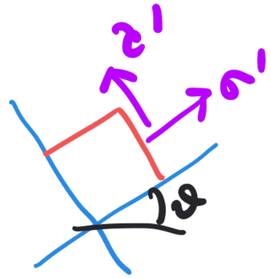
Hibbeler eq. (9.6).

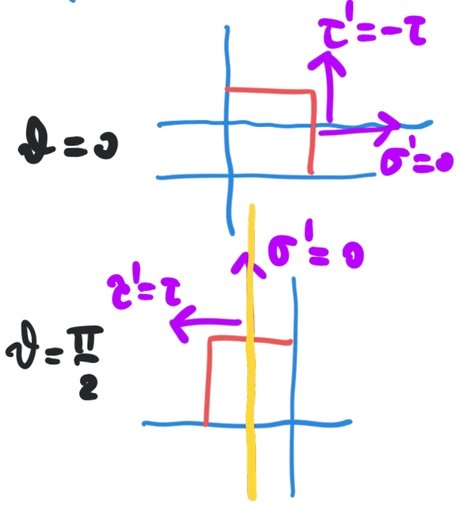
STATO TENSIONALE IN UNA BARRA DI TORSIONE



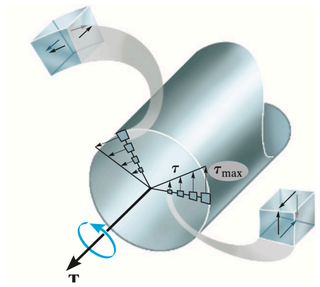


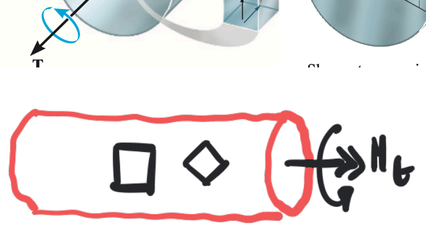


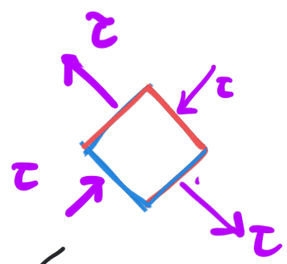


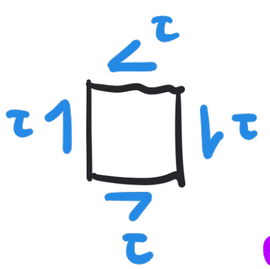


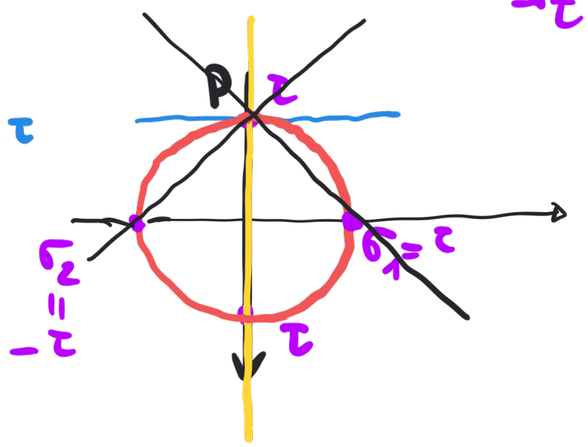
STATO TENSIONALE IN UNA BARRA DI TORSIONE

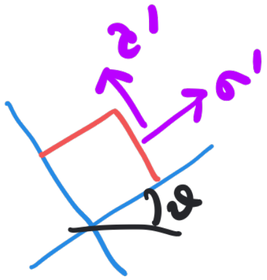


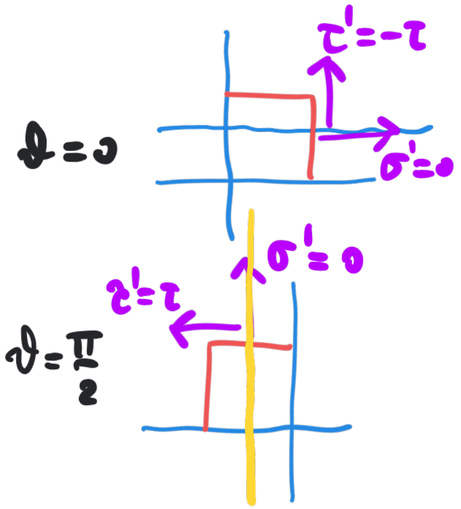




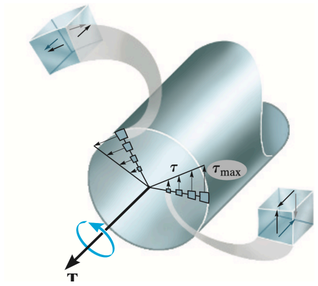


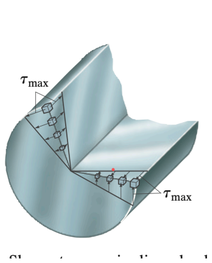


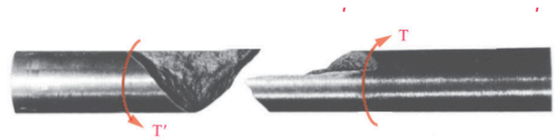




STATO TENSIONALE IN UNA BARRA DI TORSIONE

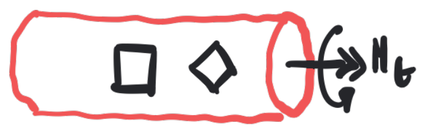


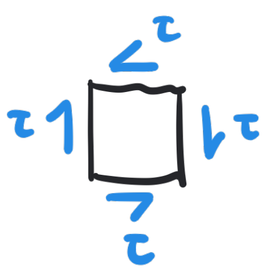


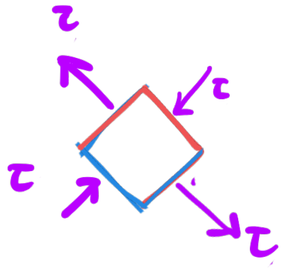


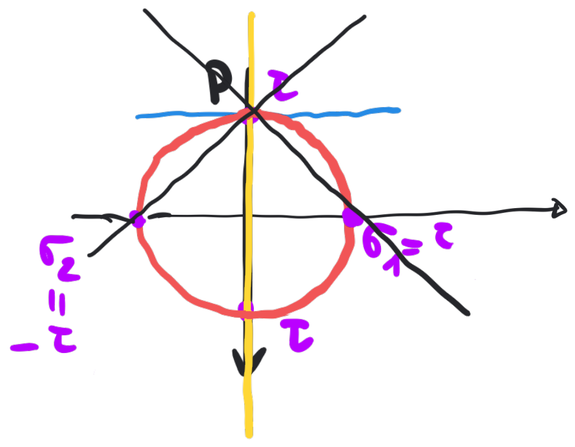
(b) Brittle Failure

Failure of a wooden shaft due to torsion.





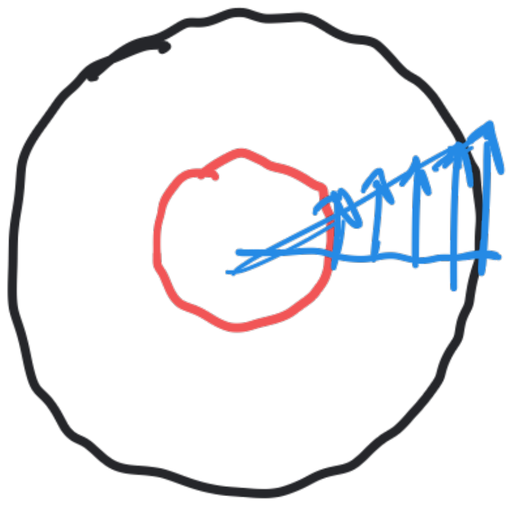




Sezioni cave

$$\tau = \frac{\rho}{R_2}\,\tau_{max}$$

$$M_t = \int_{R_1}^{R_2} 2\pi\rho\,\tau\,\rho\,d\rho = \frac{\tau_{max}}{R_2}\,2\pi\int$$



$$+ R_2 f$$

$$+ \; + \; f \; f$$
$$R_1$$