

Esercizio N°2

Dato lo stato tensionale piano definito da:

$$\sigma_x := 70\text{MPa} \quad \sigma_y := -20\text{MPa} \quad \tau_{xy} := 15\text{MPa}$$

1. Costruire il cerchio di Mohr.
2. Determinare i valori delle tensioni principali e gli angoli che ne individuano le giaciture.
3. Determinare il valore della tensione tangenziale massima e minima e la relativa giacitura.

$$C_x := \frac{\sigma_x + \sigma_y}{2} \quad C_x = 25 \cdot \text{MPa}$$

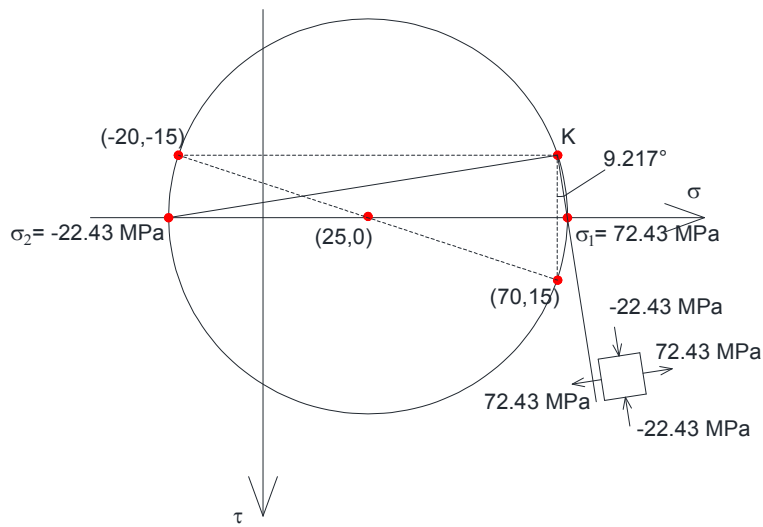
$$r := \sqrt{\left(\frac{\sigma_x - \sigma_y}{2}\right)^2 + \tau_{xy}^2} \quad r = 47.434 \cdot \text{MPa}$$

$$\sigma_1 := C_x + r \quad \sigma_1 = 72.434 \cdot \text{MPa}$$

$$\sigma_2 := C_x - r \quad \sigma_2 = -22.434 \cdot \text{MPa}$$

$$\alpha_1 := \frac{180}{\pi} \operatorname{atan}\left(\frac{\sigma_1 - \sigma_x}{\tau_{xy}}\right) \quad \alpha_1 = 9.217$$

$$\alpha_2 := 90 - \alpha_1 \quad \alpha_2 = 80.783$$



$$\tau_{\max} := r$$

$$\tau_{\max} = 47.434 \cdot \text{MPa}$$

$$\alpha_3 := \frac{180}{\pi} \operatorname{atan} \left[\frac{\sigma_x - \sigma_y}{2(|\tau_{xy}| + r)} \right]$$

$$\alpha_3 = 35.783$$

