ALMA KRİTERLERİ

SİNEK MALZEMELER İÇİN

TRESCA KRİTERİ (MAX. KAYMA GERİLMESİ)

σ_1 σ_2 σ_3

MAX MD. MIN

σ_Y (ALMA) $\geq \sigma_{HESAPLANAN}$

$\sigma_1 \leq \sigma_Y$

$\sigma_2 \leq \sigma_Y$ LAZIM

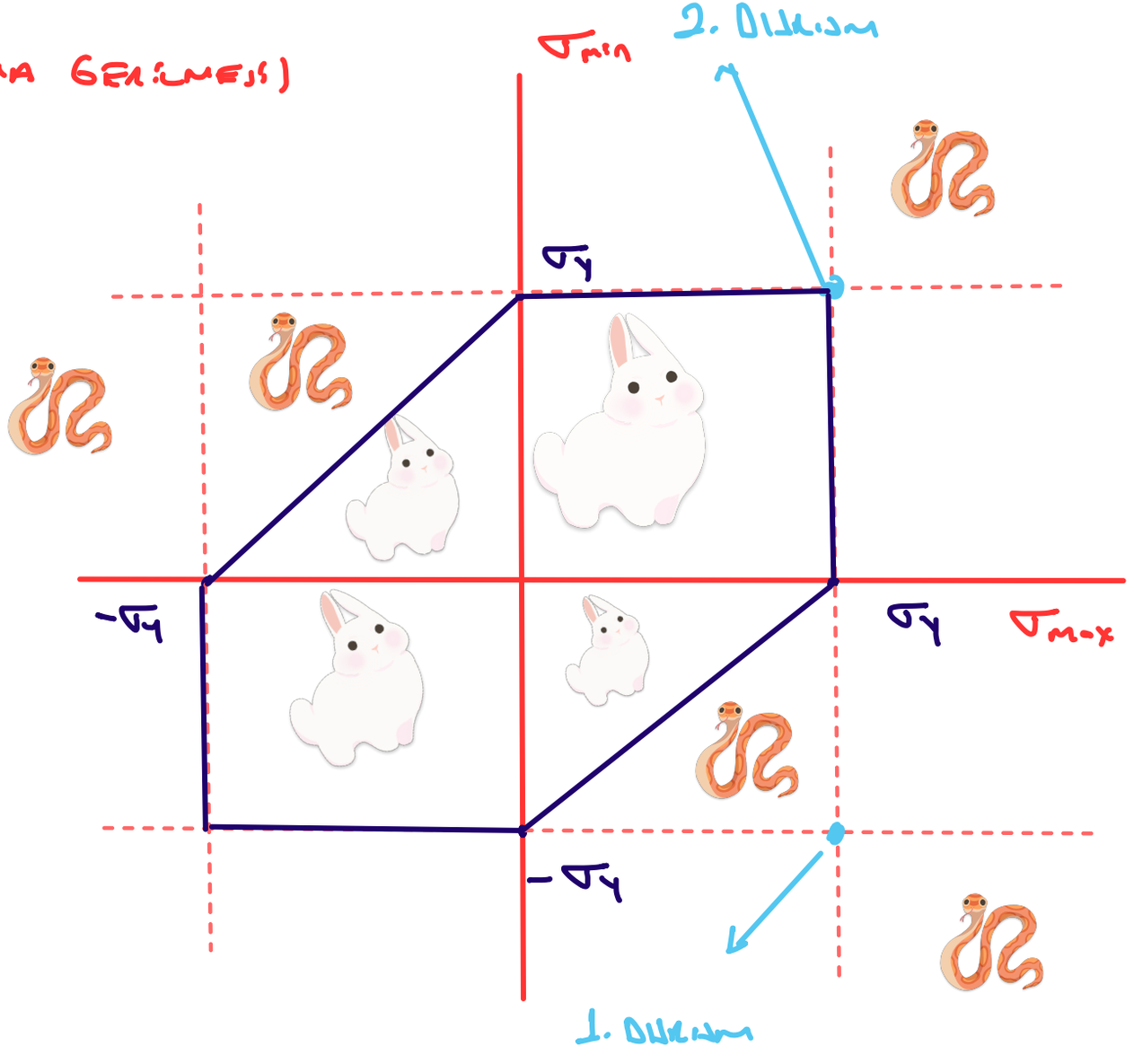
$\sigma_3 \leq \sigma_Y$

2D İÇİN $\sigma_1 =$ MAX

$\sigma_3 =$ MIN

$\sigma_2 = 0$

$\tau_Y = 0.5 \times \sigma_Y$



1. DURUM

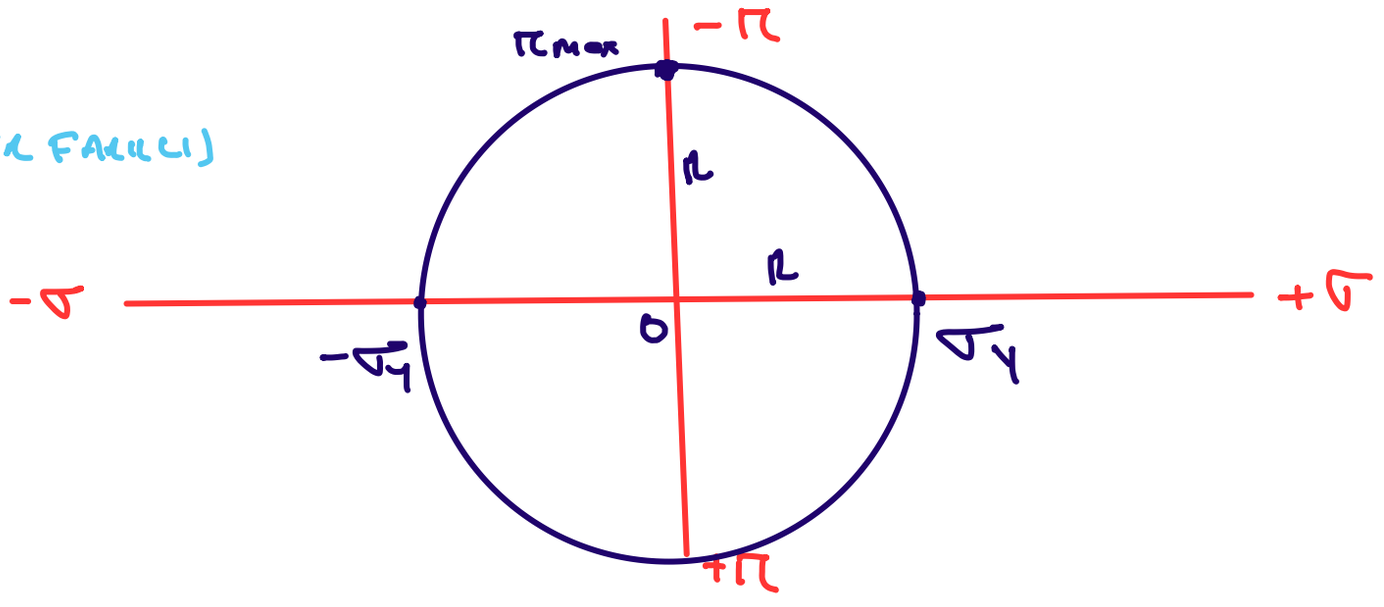
$\sigma_1 = \sigma_Y$ (İŞARETLER FARKLI)

$\sigma_2 = -\sigma_Y$

$\sigma_3 = 0$

$\tau_{max} = \sigma_Y$

↳ $\tau_{max} \leq \tau_Y = \frac{\sigma_Y}{2}$



2. DURUM

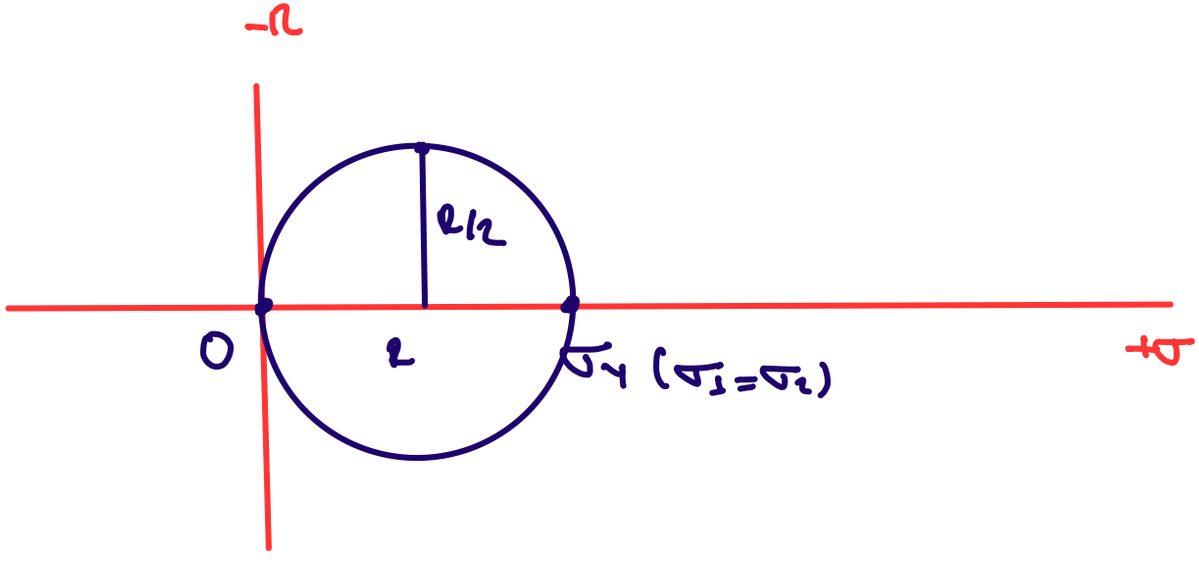
$\sigma_1 = \sigma_Y$ (İŞARETLER AYNI)

$\sigma_2 = \sigma_Y$

$\sigma_3 = 0$

$\tau_{max} = \frac{\sigma_Y}{2} = \tau_Y$

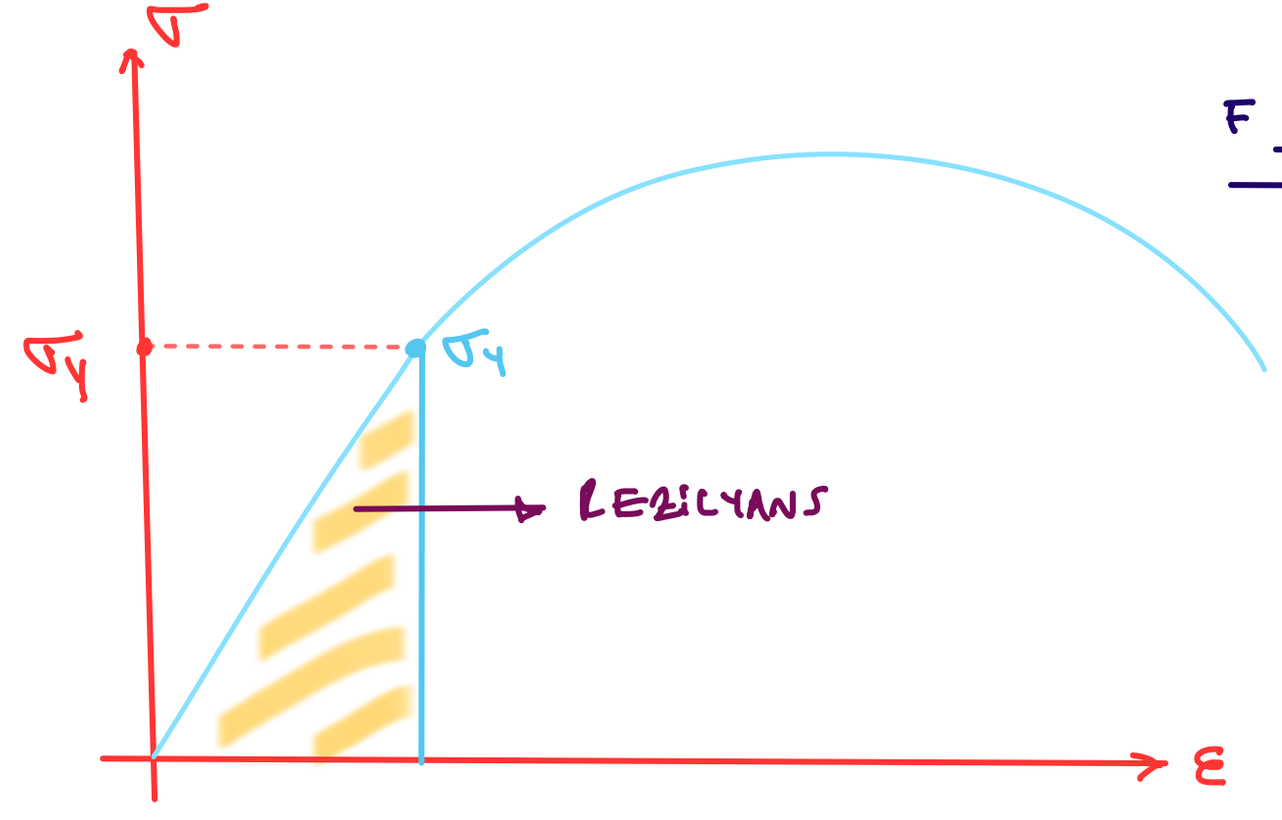
↳ $\tau_{max} \leq \tau_Y$ ✓

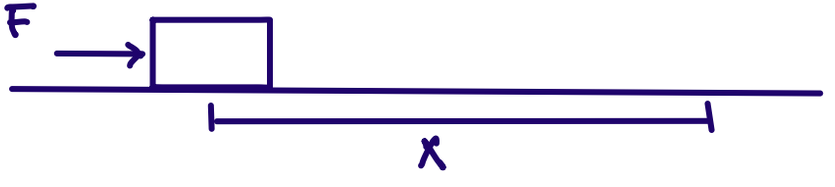


SONUÇ

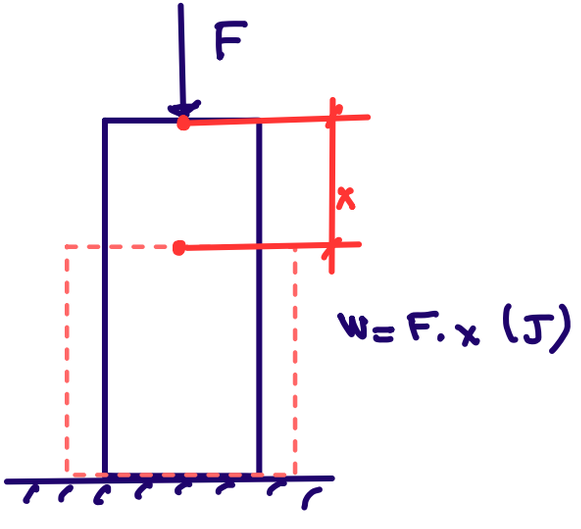
$$\tau_{max} \leq \tau_y \quad , \quad \tau_y = \sigma_y \times 0.5$$

VON MISES KRİTERİ





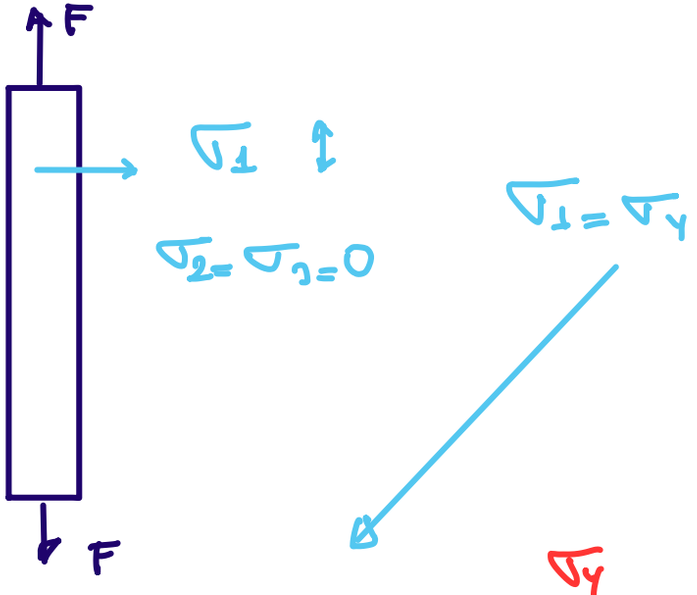
$W = F.x\ (J)$



Şekil Değişimi = Hacim Değişimi + Biçim Değişimi

Beltrami — Von Mises

$$U_{Ref.} = \frac{1}{6G} \cdot \left[\sigma_1^2 + \sigma_2^2 + \sigma_3^2 - (\sigma_1\sigma_2 + \sigma_1\sigma_3 + \sigma_2\cdot\sigma_3) \right]$$



$$U_Y = \frac{1}{6G} \cdot \left[\sigma_1^2 + \sigma_2^2 + \sigma_3^2 - (\sigma_1\sigma_2 + \sigma_1\sigma_3 + \sigma_2\cdot\sigma_3) \right]$$

σ_Y → σ_1^2 ; $\sigma_2 = 0$; $\sigma_3 = 0$; $(\sigma_1\sigma_2 + \sigma_1\sigma_3 + \sigma_2\cdot\sigma_3) = 0$

$$U_Y = \frac{\sigma_Y^2}{6G}$$

(G: Rijitlik / Kayma Modülü)

$$U_{\text{DEĞME}} = \frac{1}{6G} \cdot \left[\sigma_1^2 + \sigma_2^2 + \sigma_3^2 - (\sigma_1\sigma_2 + \sigma_1\sigma_3 + \sigma_2\cdot\sigma_3) \right] \leq U_Y \downarrow \frac{\sigma_Y^2}{6G}$$

$\Rightarrow$

- $\sigma_Y^2 \geq \left[\sigma_1^2 + \sigma_2^2 + \sigma_3^2 - (\sigma_1\sigma_2 + \sigma_1\sigma_3 + \sigma_2\sigma_3) \right]$ ... (A)

veya

- $\sigma_Y^2 \geq \frac{1}{2}\left[(\sigma_1 - \sigma_2)^2 + (\sigma_1 - \sigma_3)^2 + (\sigma_2 - \sigma_3)^2 \right]$

BU KADAR SONRASI İÇİN YETERLİLİK (EL YAZMASI) NOTLARINA BAKIN. SÖZEL İFADELER ÖNEMLİ.