Homework #5 **Deadline: April 23, 2019, 13:10.**

Show that for the incompressible fluid the principle (assumption) of the maximization of the rate of entropy production (dissipation) applied to the following three situations:

(a) $\xi = 2\mu_*|\mathbf{D}|^r$ & $\xi(\mathbf{D}) = \mathbf{T}\cdot\mathbf{D}$ & maximize w.r.t. $\mathbf{D}$

(b) $\xi = \dfrac{1}{2\alpha_*}|\mathbf{T}^d|^{r'}$ & $\xi(\mathbf{T}^d) = \mathbf{T}\cdot\mathbf{D}$ & maximize w.r.t. $\mathbf{T}^d$

(c) $\xi = \dfrac{1}{2\mu_*|\mathbf{D}|^{r-2}}|\mathbf{T}^d|^2$ & $\xi_{\mathbf{D}}(\mathbf{T}^d) = \mathbf{T}\cdot\mathbf{D}$ & maximize w.r.t. $\mathbf{T}^d$

leads to the same constitutive equation, namely

$$\mathbf{T} = m\mathbf{I} + 2\mu_*|\mathbf{D}|^{r-2}\mathbf{D}.$$

What is the relation between α_* and μ_* (both are positive constants)?