Bem. 1.3: Andere Randbedingungen

- **RB 2. Art = Neumann = natürliche RB:**

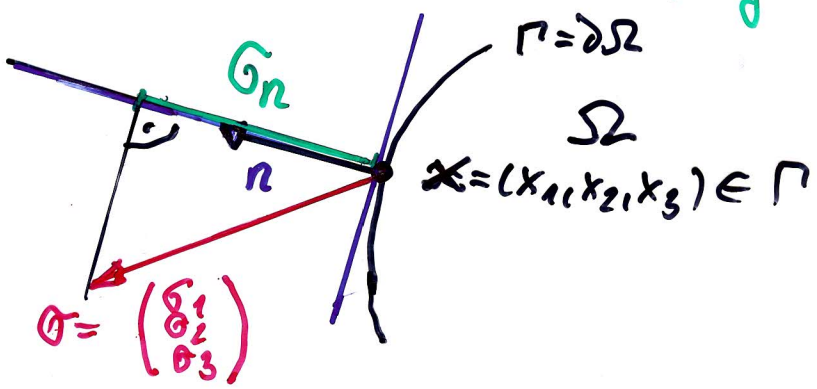
a) Wärmeisolation:

$$\sigma_n(x) = \sigma(x)\cdot n(x) := -\underbrace{\sum_{i=1}^{3} \lambda_i(x) \frac{\partial u}{\partial x_i}(x)\, n_i(x)}_{=: \frac{\partial u}{\partial N}} = 0 \quad \forall x \in \Gamma$$

b) Vorgegebener Wärmestrom

$$\sigma_n(x) = g(x), \quad \forall x \in \Gamma$$

$\hookrightarrow g = g_2 = g_N$



- **RB 3. Art = Robin = natürliche RB:**

= Freier Wärmeaustausch

$$\sigma_n(x) \equiv -\frac{\partial u}{\partial N}(x) = \alpha(x)(u(x) - g(x)) \quad \forall x \in \Gamma$$

wobei α – Wärmeübergangszahl $\quad g = g_3 = g_R$

$g = g_3 = g_R = u_A$ – Randtemperatur

- **Gemischte RB** $\Gamma = \Gamma_1 \cup \Gamma_2 \cup \Gamma_3$

- **Wärmestrahlung = nichtlineare RB:**

$$-\frac{\partial u}{\partial N} = g(u - u_A) \underset{2.B}{:=} \alpha(u^4 - u_A^4)$$