$$\omega = \sum_{i_1,\ldots,i_k} a_{i_1 i_2 \ldots i_k}(\mathbf{x})\, dx_{i_1} \wedge dx_{i_2} \wedge \cdots \wedge dx_{i_k} \quad \Leftrightarrow$$

$$\int_{\boldsymbol{\varphi}} \omega = \int_{J^k} \sum_{i_1,\ldots,i_k} a_{i_1 i_2 \ldots i_k}(\boldsymbol{\varphi}(\mathbf{t})) \frac{\partial(x_{i_1},\ldots,x_{i_k})}{\partial(t_1,\ldots,t_k)}\, d\mathbf{t}.$$

$$\omega = \sum_I b_I\, dx_I \in \mathcal{E}_k(E), \quad \kappa = \sum_{I'} c_{I'}\, dx_{I'} \in \mathcal{E}_l(E), \quad \Rightarrow$$

- $\omega \wedge \kappa = \sum_{I,I'} b_I(\mathbf{x}) c_{I'}(\mathbf{x})\, dx_{i_1} \wedge \cdots \wedge dx_{i_k} \wedge dx_{i'_1} \wedge \cdots \wedge dx_{i'_l}$
- $d\omega = \sum_I (db_I) \wedge dx_I \;= \sum_I \sum_{i=1}^n (D_i b_I)\, dx_i \wedge dx_I.$
- $\omega \wedge \kappa = (-1)^{kl} \kappa \wedge \omega$
- $d(\omega \wedge \kappa) = (d\,\omega) \wedge \kappa + (-1)^k \omega \wedge (d\kappa)$

$$T : E \to V, \quad T(\mathbf{x}) = (\mathbf{t}_1(\mathbf{x}), \mathbf{t}_2(x), \ldots, \mathbf{t}_m(\mathbf{x})), \quad \omega = \sum_I a_I(\mathbf{y})\, dy_I \in \mathcal{E}_k(V) \quad \Rightarrow$$

- $\omega_T = \sum_{0 \le i_1 \le \cdots \le i_k \le 1} a_{i_1 \ldots i_k}(T(\mathbf{x}))\, dt_{i_1} \wedge \cdots \wedge dt_{i_k}$
- $(\omega \wedge \kappa)_T = \omega_T \wedge \kappa_T$ if $\kappa \in \mathcal{E}_l(V)$
- $d(\omega_T) = (d\omega)_T$
- $\int_{\boldsymbol{\varphi}} \omega_T = \int_{T \circ \boldsymbol{\varphi}} \omega$

- $\boldsymbol{\psi}_{i\alpha}(s_i, \ldots, s_{k-1}) = (s_1, \ldots, s_{i-1}\alpha, s_i, \ldots, s_{k-1})$
- $\partial \boldsymbol{\varphi} = \sum_{i=1}^k \sum_{\alpha=0,1} (-1)^{i+\alpha} \boldsymbol{\varphi} \circ \boldsymbol{\psi}^k_{i\alpha}$