

$$I(d, \{p\}) \rightarrow I(d, \{p\}) + \int_{(\mathbb{R}^d)^n} \mathrm{d}^d k_1 \dots \mathrm{d}^d k_l \left( \alpha d \delta_{q_j k_i} f + \alpha q_j \cdot \frac{\partial}{\partial k_i} f \right)$$