Let $P(\mathbf{a}) = \mathbf{a} \cdot \mathbf{D}$ be a linear differential operator with constant coefficients $a_i$, acting on smooth functions on $\mathbb{R}^3$. Here $\mathbf{D} = \sum_{i=1}^3 a_i \frac{\partial}{\partial x_i}$ is a linear differential operator with constant coefficients $a_i$, acting on smooth functions on $\mathbb{R}^3$. Then $\mathbf{D} u(x) = \sum_{i=1}^3 a_i \frac{\partial u}{\partial x_i}(x)$ for any smooth function $u(x)$. Let $\mathbf{a} = (a_1, a_2, a_3) \in \mathbb{R}^3$. Then $\mathbf{D} u(x) = a_1 \frac{\partial}{\partial x_1} u(x) + a_2 \frac{\partial}{\partial x_2} u(x) + a_3 \frac{\partial}{\partial x_3} u(x)$.

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