

Basic Differential Operatorology

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9:25 AM

$$\operatorname{div} \left(\sum \hat{F}_i \frac{\partial}{\partial x_i} \right) = \sum \frac{\partial}{\partial x_i} f_i$$

||
D

$$D^* = \sum -\frac{\partial}{\partial x_i} \hat{F}_i$$

$$\widehat{\operatorname{div}} D = -(D + D^*)$$

$$0 = \int 1 \cdot DF = \int F D^* 1$$
$$\Rightarrow D^* 1 = 0$$

In a world with only operators, how do you apply an operator to a function?
That is, given D and F , write \widehat{DF} only using D and \hat{F} .

Possibly Related - what's Δ (say on $U(\mathbb{R}^n)$) in the language of differential operators?
(Though if I believe 2009-01/ [iof F mod CC](#), I may not really need to know)

What is $\frac{\partial}{\partial x_i} \mapsto \frac{\partial}{\partial x_i} + \frac{\partial}{\partial y_i}$ in abstract terms?