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Exterior derivative operator on space of smooth differential forms

 For every smooth manifold M , $\exists!$ linear maps

$$d^k : \text{Forms}^k(M) \rightarrow \text{Forms}^{k+1}(M)$$

for each $k \geq 0$ satisfying

$$\begin{aligned} d^0 f(X) &= Xf \\ d^{k+l}(\omega \wedge \eta) &= d^k \omega \wedge \eta + (-1)^k \omega \wedge d^l \eta \\ d^{k+1} d^k &= 0 \end{aligned}$$

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