Baez and Munian

Exercise 51 , 24/04/2010

51. Locally the exterior derivative acts as

$$d\omega = d(\omega_I dx^I)$$
$$= \partial_\mu \omega_I \, dx^\mu \wedge dx^I$$

which we can write as

$$= dx^\mu \wedge \partial_\mu \omega_I \, dx^I$$

In other words, we can think of d as the operator

$$\boxed{d = dx^\mu \wedge \partial_\mu (\cdots)}$$
$$= dt \wedge \partial_t(\cdots) + dx^\mu \wedge \partial_\mu (\cdots)$$

$$\text{so } d\omega = dt \wedge \partial_t \omega + d_s \omega .$$