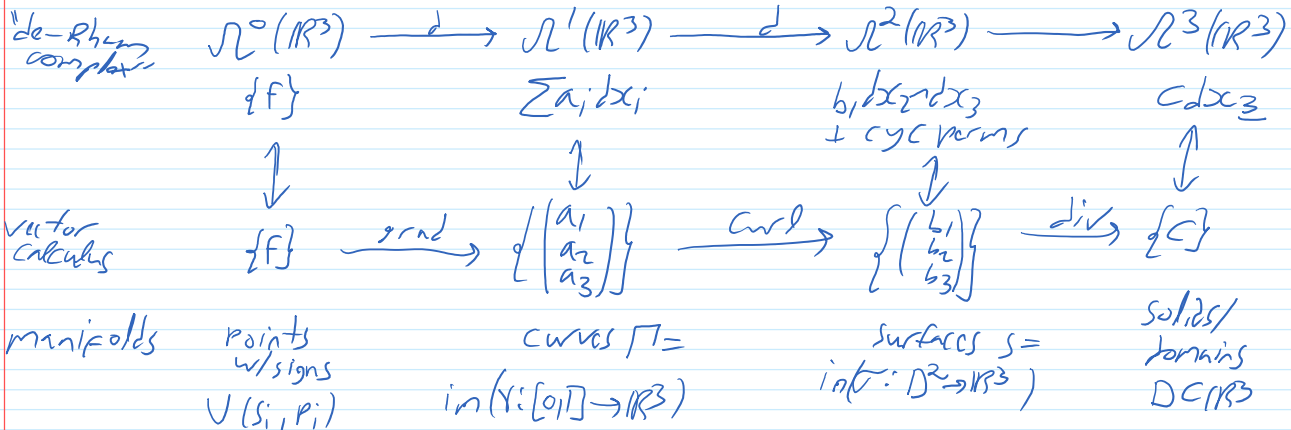


1617-257 Thu Mar 30, hour 69: Stokes' theorem in low dimensions

February 15, 2017 12:58 PM

Read along: Sec 37-38. Eval rate: 31/92.

$$W \in \mathcal{L}^{k-1}(M^k) \Rightarrow \int_M dW = \int_{\partial M} W$$



integration

$\int_M W$ $\sum S_i f(p_i)$ $\int_0^1 \vec{a} \cdot \dot{\gamma} = \int_n \vec{a} \cdot \vec{T} dV$ $\int_S b \cdot \vec{n} dV$ $\int_D c$

Stokes:

$\int_0^1 (\text{grad } f) \cdot \dot{\gamma} = f(\gamma(1)) - f(\gamma(0))$ $\int_S (\text{curl } a) \cdot \vec{n} dV = \int_{\partial S} \vec{a} \cdot \vec{T} dV$ $\int_D \text{div } b = \int_{\partial D} b \cdot \vec{n} dV$

Aside

$$\sigma^*(b_1 dx_2 dx_3 + \text{cyc perms}) = (b_1 dx_2 dx_3 (\sigma_x^* \sigma_1, \sigma_x^* \sigma_2) + \text{cp}) dx_1 dy_1$$

$$= (b_1 (\partial_x \sigma_2 - \partial_y \sigma_3) + \text{cp}) dx_1 dy_1 = b \cdot [(\partial_x \sigma) \times (\partial_y \sigma)] dx_1 dy_1$$

$$= b \cdot \vec{n} \cdot \text{Vol}(\partial_x \sigma, \partial_y \sigma) dx_1 dy_1$$

done later

What is Stokes' Thm in each of these circumstances?
 It is what it is: $\int_M dW = \int_{\partial M} W$
 Really were answering "translate beauty to old-fashioned ugliness?"