$\Rightarrow$ $\mathrm{Res}_{p_\nu}(\omega) = 0$ for $\nu = 2 \cdots l$. $\Rightarrow$ $\mathrm{Res}_{p_1}(\omega) = 0$ $\Rightarrow$ D must pass p_1. More precisely,

$$\mathrm{Res}_{p_\nu}(\omega) = \mathrm{Res}_{p_\nu}\left(\frac{g\, dz_1 \wedge dz_2}{f\ f'}\right)$$

$$= \left(\frac{1}{2\pi\sqrt{-1}}\right)^2 \int_{\substack{|f|=\epsilon \\ |f'|=\epsilon}} \frac{g\, dz_1 \wedge dz_2}{f\ f'} = \left(\frac{1}{2\pi\sqrt{-1}}\right)^2 \int \frac{g\, df_1 \wedge df_2'}{f\ f'\ J_f(z)}$$

$$= \frac{g(p_\nu)}{J_f(p_\nu)} = 0 \quad \text{since} \quad g(p_\nu) = 0.$$

∎

An extension to general vector bundles will be given in Section 4 at the end of this chapter.

⌜ By p33. Stokes' Theorem for Analytic Varieties, for a general surface S and $p_1, \cdots p_\nu \cdots p_\ell \in S$ which are smooth points,

$$0 = \int_{S - \cup U(p_\nu)} d\omega = \sum_\nu \int_{\partial U(p_\nu)} \omega$$

∎

3. Rudiments of Commutative and Homological Algebra with Applications.

Commutative Algebra

As the reader is no doubt aware, laying the proper algebraic foundations for the subject of algebraic geometry is an all-consuming task. On the other hand, just as sheaf