The generic curve C_λ is isomorphic to a smooth plane quartic, hence has genus 3 and Euler characteristic -4; C_λ will be singular if H_λ either contains a point $p \in R$ or is tangent to $\mathcal{S}$. (See Figure 17.)

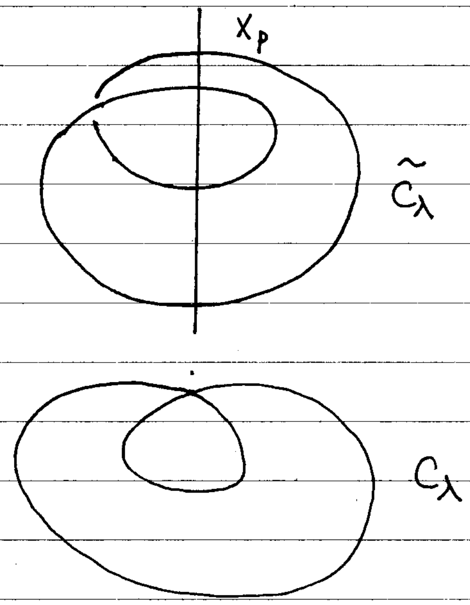

Figure 17.

For generic λ, $\mathcal{S} \cap H_\lambda$ smooth, and $\pi^{-1}(\mathcal{S} \cap H_\lambda)$ is smooth since π is one to one, onto $\mathcal{S} - R$.
$\Rightarrow C_\lambda \cong \mathcal{S} \cap H_\lambda \Rightarrow$ Since $\deg \mathcal{S} = 4$, $\mathcal{S} \cap H_\lambda$ is a quartic curve in H_λ ($\because \#(\mathcal{S} \cap H_\lambda \cdot H) = \#(\mathcal{S} \cdot \ell) = 4$).
$\Rightarrow C_\lambda \cong$ a smooth quartic. $\Rightarrow$ By genus formula,

$$g(C_\lambda) = \frac{(4-1)(4-2)}{2} = 3.$$

$$\chi(C_\lambda) = 2 - 2g(C_\lambda) = 2 - 2 \cdot 3 = -4$$