all. It follows that the Reiss relation is both necessary and sufficient.

Γ $f(x,y) = f_1(y) + f_2(y)x + f_3(y)x^2 + x^3 g(x,y)$ is the unique representation. Since we have only to consider points of $\{f=0\} \cap \{x=0\}$, $L \cap C = \{(0, q_\nu) = P_\nu\}$.

$$f_{xx} = 2 f_3(y)$$
$$f_{xy} = (f_2)_y + 2x(f_3)_y$$
$$f_{yy} = (f_1)_{yy} + (f_2)_{yy}x + x^2(f_3)_{yy}.$$
$$f_{xx}(P_\nu) = 2f_3(q_\nu) \quad f_{xy}(P_\nu) = (f_2)_y(q_\nu) \quad f_{yy}(P_\nu) = (f_1)_{yy}(q_\nu).$$

Given $a_\nu, b_\nu, c_\nu \in \mathbb{C}$, we have to find $f(x,y)$ s.t

$2f_3(q_\nu) = a_\nu$, $(f_2)_y(q_\nu) = b_\nu$. $(f_1)_{yy}(q_\nu) = c_\nu$

If we let $U = \{f(x,y) \mid \deg f = n\}$, $W = \{x^3 g(x,y) \mid \deg(g) = n-3\}$,

$$\begin{array}{ccc} f & \longmapsto & f+W \in V = U/W \\ & & \downarrow \\ & & [f+W] \in \mathbb{P}(V) \cong \mathbb{P}^{3n-1} \end{array}$$

⇒ If we have a curve f with prescribed second-order behavior at points P_ν, we get a point in $\mathbb{P}(V)$.
Conversely, given a point z in $\mathbb{P}(V)$, $\exists f \in U$ s.t $[f+W] = z$. ⇒ We have a curve f.

At each point $P_\nu \in C \cap L$, f must satisfy the following:

① $f(P_\nu) = 0 = y(P_\nu)$

② $f_x(P_\nu) + f_y(P_\nu)\, y'(P_\nu) = 0$ $\quad y'(P_\nu)$ tangent

③ $f_{xx}(P_\nu) + 2f_{xy}(P_\nu)\, y'(P_\nu) + f_{yy}(P_\nu)\, y'(P_\nu)^2 + f_y(P_\nu)\, y''(P_\nu) = 0$

$y''(P_\nu)$ second order of the curve.