$\ulcorner$ $|\lambda Q + Q'| = 0$ has 3 roots, and if we add ∞, then it has 4 roots. $\lambda = \infty$ corresponds to F, and so the three singular quadrics corresponding to 3 roots ($\neq \infty$) are not F. $\Rightarrow$ $m_F(L \cdot W_1) = 1$ $\Rightarrow$ By the argument on P832 note, F is a smooth point of W_1. $\lrcorner$

Note that the polynomial $|\lambda Q + Q'|$ will fail to have degree 3 exactly when the upper left-hand entry of Q' is zero, i.e., when the quadric G contains the point $[1, 0, 0, 0]$.

$\ulcorner$

$$\begin{vmatrix} q'_{00} & q'_{01} & q'_{02} & q'_{03} \\ q'_{10} & q'_{11}+\lambda & q'_{12} & q'_{13} \\ q'_{20} & q'_{21} & q'_{22}+\lambda & q'_{23} \\ q'_{30} & q'_{31} & q'_{32} & q'_{33}+\lambda \end{vmatrix} = |\lambda Q + Q'| = 0$$

$\Rightarrow$ $q'_{00} = 0$ $\Leftrightarrow$ $|\lambda Q + Q'|$ fails to have degree 3.

And

$$(1\ 0\ 0\ 0)\begin{pmatrix} & & \\ & q'_{ij} & \\ & & \end{pmatrix}\begin{pmatrix}1\\0\\0\\0\end{pmatrix} = q'_{00} = 0 \Leftrightarrow G \ni$$

$[1, 0, 0, 0]$. $\lrcorner$

The tangent plane to W_1 at F is thus the space of