

Γ F_i is a line in $\mathbb{P}^2 \Rightarrow F$ has 6 C_2 double points \Rightarrow Since $\# \{r(p_i)\} = 15$, the set of singular points of F is $\{r(p_i)\}$.

\Rightarrow

It follows that each of the lines L_i contains exactly five of the points $r(p_i)$, and correspondingly that the plane $\overline{p_i, L_i} \subset \mathbb{P}^3$ contains exactly six of the double points p_i of S .

Γ L_1 intersects $L_2, \dots, L_6 \Rightarrow L_1$ contains five of $r(p_i)$'s. $\Rightarrow \overline{p_i, L_i}$ contains six of double points, since $\overline{p_i, p_i'}$ does not contain any other double point ($\because \deg S = 4$), where p_i' is a double point on L_i .

\Rightarrow

Our first observation, then, is that

Through each double point p of S there pass six hyperplanes, each containing six of the points p_i .

Γ $\overline{p_i, L_i}$ is a hyperplane in \mathbb{P}^3 .

\Rightarrow

Let us consider in more detail one of the hyperplanes $h = \overline{p_i, L_i}$ found in the last argument.