

homomorphic function on S , which must be constant. $\Rightarrow H^0(S, \mathcal{O}(K-D)) = 1$.

If $K \neq D$, let $\sigma \in H^0(S, \mathcal{O}(K-D))$.

\Rightarrow Since $\deg(K-D) = 0 = \deg K - \deg D = 2g-2 - (2g-2)$, $(\sigma=0) \sim K-D$. $\Rightarrow (\sigma=0)$ is an effective divisor.

\Rightarrow Effective divisors have positive degrees unless they are nonvanishing. If σ is nonvanishing, σ is not a section of $[K-D]$. $\Rightarrow H^0(S, \mathcal{O}(K-D)) = \emptyset$. \square

unless $[K-D]$ is trivial, which means $K=D$.

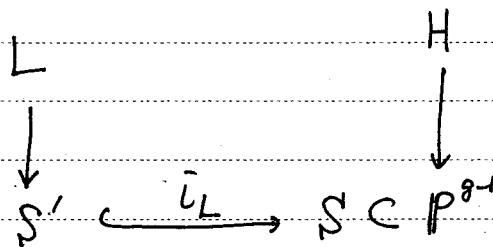
This implies that: if $S \subset \mathbb{P}^{g-1}$ is any nondegenerate curve of genus g and degree $2g-2$, then S is a canonical curve.

\square $S \subset \mathbb{P}^{g-1}$. H hyperplane of \mathbb{P}^{g-1} .

$\Rightarrow \#(S \cdot H) = \deg S = c_1([H]|_S) = 2g-2$

\Rightarrow By the note above, $[H]|_S = K_S \Rightarrow h^0(K-H) = 1$ and $[H]|_S \neq K_S \Rightarrow h^0(K-H) = 0$.

We don't need this.
I think that the statement is as follows: more precisely
If $S \subset \mathbb{P}^{g-1}$ is a nondegenerate curve of genus g and degree $2g-2$ embedded from S' by i_L , then S is a canonical curve, where L is a line bundle over S' .



\Rightarrow We are going to show that $L = K_{S'}$. If not, By the argument above, $h^0(L) = g-1$. This contradicts.

I have a corrected proof of this PAGE see last yellow page.