of $[p+q]$. $\Rightarrow (f \cdot s_0 = 0) \neq p+q$.
$\Rightarrow \dim H^0(S, \mathcal{O}(p+q)) \neq 1$. Similarly for $p=q$.

Thus if ι_K is not an embedding $\exists$ a meromph. function on S having only two poles.

$$S \xrightarrow{f} \mathbb{P}^1$$

$$\Rightarrow \deg f^*(p) = n = \sum_{q \in f^{-1}(p)} v(q).$$

Let $p = \infty$. $n = 2$. $\Rightarrow \deg f^*(p) = 2$
$\Rightarrow S$ is a two-sheeted branched covering of $\mathbb{P}^1$.

Hyperelliptic Riemann surfaces form an important subset of the set of all curves of genus g, with properties that often differ markedly from those of a general Riemann surface. We will discuss them in detail later on in this section; for the time being, we merely assure the reader that the "general" Riemann surface of genus $g \geq 3$ is indeed nonhyperelliptic.

Note that if $L \longrightarrow S$ is any line bundle of degree $2g-2$, then

$$h^0(K-D) = \begin{cases} 0 & \text{if } D \neq K \\ 1 & \text{if } D = K; \end{cases}$$

by Riemann-Roch, if $D \neq K$. we find $h^0(D) = g-1$.

Γ $h^0(K-D) = h^0(D) - (2g-2) + g - 1 = h^0(D) - g + 1$

$\Rightarrow$ If $K=D$, $[K-D]$ is trivial bundle. $\Rightarrow \exists$ a