$\eta \longmapsto \eta\otimes s_0$ is well-defined, since $(\eta\otimes s_0=0)$
$= (\eta=0)+(-q)$ and $(\eta=0)\geq q$.

Suppose that all $\sigma\in H^0(S,\Omega^1(-p-q))$ are zero at p. Once again, by using the argument above,

$$\begin{array}{ccc} H^0(S,\Omega^1(-q)) & \xleftarrow{\ \psi\ } & H^0(S,\Omega^1(-p-q)) \\ & & \rotatebox{90}{$\in$} \\ \sigma\otimes s_1 & \longleftarrow & \sigma \end{array}$$

ψ is isomorphism $\Rightarrow$ $h^0(K-p) = h^0(K-p-q) = g-1$.
$= h^0(K-q)$ $\Rightarrow$ Contradicts to the fact that $\dim H^0(K-p-q)$ is larger than $\dim H^0(K-q)$.
$\Rightarrow \exists\ \sigma\in H^0(S,\Omega^1(-p-q))$. s.t $\sigma(p)\neq 0$.
$\Rightarrow \eta' = \eta - \dfrac{\eta(p)}{\sigma(p)}\cdot\sigma$ $\Rightarrow$ $\eta'(q)\neq 0$ and $\eta'(p)=0$.
and $\eta'/s_1^{-1} = \eta'\otimes s_1 \in H^0(S,\Omega^1)$ and $\eta'\otimes s_1(q)\neq 0$
$\eta'\otimes s_1(p)=0$

② $p=q$.

$$\begin{array}{ccc} H^0(S,\Omega^1(-2p)) & \longrightarrow & H^0(S,\Omega^1(-p)) \\ \rotatebox{90}{$\in$} & & \\ \sigma & \longmapsto & \sigma\otimes s_1 \end{array}$$

where $(s_1=0)=p$.
If all $\eta\in H^0(S,\Omega^1(-p))$ are zero at p.
$\dfrac{\eta}{s_1}\in H^0(S,\Omega^1(-2p))$. $\Rightarrow$ $\dim H^0(S,\Omega^1(-2p))$
$= h^0(K-p)$ $\Rightarrow$ By the assumption, this can not happen. $\Rightarrow \exists\ \eta\in H^0(S,\Omega^1(-p))$ with $\eta(p)\neq 0$.
$\Rightarrow$ $\eta\otimes s_1\in H^0(S,\Omega^1)$ $\Rightarrow$ $\eta\otimes s_1(p)=0$ and its order is exactly one.

By Riemann-Roch,
$h^0(K-p-q) = g-3+h^0(p+q)$.