$\#$ of independent relations among the row vectors
$= g - \#$ of linearly independent row vectors.
$=$ dim of a set of vectors perpendicular to all row vectors. 」

We have proved the Riemann-Roch for effective divisors, and hence for all divisors of degree $\geq g$.

「 Suppose D is a divisor of degree $\geq g$.
By the corollary of Jacobi inversion, D is linearly equivalent to an effective divisor. 」

For a general D of degree $\leq g-2$, we apply the formula to $K-D$ to obtain

$$h^\circ(K-D) = (2g-2-d) - g + 1 + h^\circ(D)$$
$$\Rightarrow \quad h^\circ(D) = d - g + 1 + h^\circ(K-D).$$

「 $\deg(K-D) = 2g-2-d \Rightarrow 2g-2-d \geq 2g-2-g+2$
$= g \Rightarrow K-D \sim$ effective divisor $\Rightarrow$ We have the formula to apply to $K-D$. 」

Finally, if $\deg D = g-1$ and neither D nor $K-D$ is linearly equivalent to an effective divisor, then $h^\circ(D) = h^\circ(K-D) = 0$, and the formula again holds.

「 $h^\circ(D) = \dim H^\circ(S, \mathcal{O}(D)) \neq 0 \Rightarrow \exists\ \sigma \in H^\circ(S, \mathcal{O}(D))$
$\Rightarrow (\sigma = 0) \sim D \Rightarrow$ Since $(\sigma=0)$ is an effective divisor, D must be linearly equivalent to an effective divisor. ※」