$\ulcorner$ $f^*\omega = f^*\left(\frac{g(\omega)}{h(\omega)} d\omega \right) = \frac{g(z^v)}{h(z^v)} dz^v = \frac{g(z^v)}{h(z^v)} v z^{v-1} dz$

$\Rightarrow \operatorname{ord}_p(f^*\omega) = \#$ of multiplicities at p
$= (v-1) + v \cdot \operatorname{ord}_{f(p)}(\omega)$

$\operatorname{ord}_{f(p)}(\omega) = \#$ of multiplicities at $f(p)$.
See P130 for the definition of ord. We may take
z is a local defining function for 0 (p in S) at 0, &
ω " for 0 ($f(p)$ in S'). $\lrcorner$

This implies the equation of divisors on S

$$(f^*\omega) = f^*(\omega) + \sum_{p \in S} (v(p)-1) \cdot p$$

i.e.,
$$K_S = f^* K_{S'} + B,$$

$$\deg K_S = n \cdot \deg K_{S'} + \sum_{p \in S} (v(p)-1).$$

$\ulcorner$ $\operatorname{ord}_p(f^*\omega) = v \cdot \operatorname{ord}_{f(p)}(\omega) + (v-1)$.

Let $(\omega) = (\omega = 0) = \sum a_i P_i'$.
$\Rightarrow$ For each $P_i' \in S'$, $v(P) \cdot a_i = v(P) \cdot \operatorname{ord}_{\underset{P_i'}{\overset{\shortparallel}{f(p)}}}(\omega)$
where $p \in f^{-1}(P_i')$.

$$(f^*\omega) = \sum_{p \in S} \operatorname{ord}_p(f^*\omega) \cdot p$$

$$= \sum_{p \in S} v(p) \cdot \operatorname{ord}_{f(p)}(\omega) \cdot p + \sum_{p \in S} (\overset{\underset{\shortparallel}{v(p)}}{v} - 1) \cdot p$$

$$= \sum_{p \in S} (v(p)-1) \cdot p + \sum_{p \in S} v(p) \cdot \operatorname{ord}_{f(p)}(\omega) \cdot p.$$