From this, it is easy to show that

$$\sum_{n\geq 0}^{\infty} \mathbb{J}_n(0)\, T^n = \frac{d}{dT}\left[\tfrac{1}{2}\ln(1-T) + \frac{1}{1-T} + \frac{T}{(1-T)\ln(1-T)}\right].$$

IX. Vojta's proof of Faltings' Thm [4] [8] [9].

Note that the Prop. 2.7.3 [ ] is very important. we've the consequence:

Vojta's proof still holds.

By the way, if we do the same thing for n times copy for curve C, then we can expect that

$$(2g-2)\, h(p) \leq (1+\varepsilon)\, d_a(P) + O(1)$$

for any alg. pt $p \in C(\bar{K})$.

X. Ampleness of $\omega_{X/\mathrm{Spec}\,R}$ with X an arithmetic surface if $g \geq 2$.

$\omega_{X/\mathrm{Spec}\,R}$ ample iff $\omega_{X/\mathrm{Spec}\,R}^2 > 0$ iff for any horizontal divisor D, $\omega_{X/\mathrm{Spec}\,R} \cdot D \gtrsim 0$.

i.e. $\omega_{X/\mathrm{Spec}\,R}^2 > 0$ iff $\exists$ Horizontal div. D s.t. $\omega \cdot D > 0$.

In fact, that's the direct consequence of Zhang's result and Gillet and Soulé's arithmetic ampleness.