

6.2 Def Poincaré's rank is $r = k - 1$

where $B(z) = \frac{B_0(z)}{z^k}$ $B_0(0) \in GL(p, \mathbb{C})$

Prove $b \geq r$ where $b = \lim_{z \rightarrow 0} \det U(z)$ from (5-3)

6.3ⁿ Prove that for any $U(z)$ - hol around 0 and invertible outside 0

Serre's(?) Lemma

\exists hol. inv. τ in 0 $T(z)$ s.t. \therefore

$$T(z)U(z) = z^C V(z)$$

$$C = \begin{pmatrix} c_1 & & 0 \\ & \ddots & \\ 0 & & c_p \end{pmatrix} \quad c_1 \geq \dots \geq c_p \geq 0 \quad (V(z) \text{ - hol. inv. at } 0) \\ c_i \in \mathbb{Z}$$

6.4^{2x} (E. Corelis(?) thesis) Prove $b \leq \frac{p(p-1)}{2} r$

[use 6.3 and prove $c_i - c_{i+1} \leq r \quad \forall i$]

6.5 Prove that in (6.11) for Fuchsian eq. (6.2) first ~~vector~~ elt of $U_0(0) \neq 0$

6.6 Prove that Levelt's exponents for Fuchsian eq (6.1) at $z_0 \neq 0$ are $0, 1, \dots, p-1$
coefficients are holom.