(2) Somit läßt sich Q_M definieren durch

$$Q_M = \begin{vmatrix} 1 & \rho\sigma & 0 & \cdots & 0 & 0 \\ \eta & \alpha & \rho\sigma & \cdots & 0 & 0 \\ \eta^2 & 1 & \alpha & \cdots & 0 & 0 \\ \eta^3 & \eta & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & & \\ \eta^{M-2} & \eta^{M-4} & \eta^{M-5} & \cdots & \alpha & \rho\sigma \\ \eta^{M-1} & \eta^{M-3} & \eta^{M-4} & \cdots & 1 & \alpha \end{vmatrix}$$

(3) Entwicklung nach der 1. Spalte:

$$Q_M = 1 \cdot A_{M-1} - \eta \cdot \rho\sigma \cdot A_{M-2} +$$

$$+ \eta^2 (\rho\sigma)^2 A_{M-3} - + \cdots =$$

$$= A_{M-1} - \tau A_{M-2} + \tau^2 A_{M-3} - + \cdots$$

$$\boxed{Q_M = \sum_{\nu=0} (-\tau)^\nu A_{M-\nu-1}}$$

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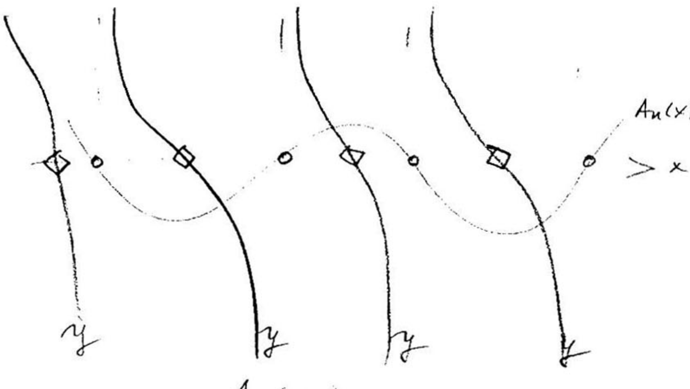
Im Gegenteil:

wenn $A_n(x_\mu) = 0$

ist $\left(\frac{A_M(x_\mu)}{A_n(x_\mu)}\right) = \infty$ oder unbest.

Die Wurzeln von $\left(\frac{A_M(x)}{A_n(x)}\right) = 0$

können gar nicht mit denen von $A_n(x)$ zusammenfallen:



$$\left(\frac{A_M(x)}{A_n(x)}\right) = y$$

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$(4M^2 - 6M \ldots)$ [illegible]

abc $\quad \frac{1}{6}\{2M(4M-2)(M-1)\}$ $\Rightarrow 8M^3 - 12M^2 + 4M$

$\quad a \to b \to c$

$\quad M \; (4M-4)(2M-1)$ $\quad 8M^3 - 12M^2 + 4M$ ✓

$\quad c \to b \to a$

$$\underline{\underline{\frac{1}{6}[48M^3 - 72M^2 + 24M]}}$$

acc $\quad 2M\binom{M}{2} = M^2(M-1) = \underline{\underline{\frac{1}{6}[6M^3 - 6M^2]}}$

bbb $\quad \frac{1}{6}\{4M(4M-2)(4M-4)\} =$

$$= \underline{\underline{\frac{1}{6}[64M^3 - 96M^2 + 32M]}}$$

bbc $\quad \{\frac{1}{2}[4M(4M-2)] \cdot (\underset{c}{M-2}) + \underset{A}{4M}\} =$

darin sind auch
gezählt:

für die nur 1 Kante vom Typ c
blockiert ist; daher

$$= 4M(2M-1)(M-2) + 4M =$$

$$= 4M(2M^2 - 5M + 2) + 4M = 8M^3 - 20M^2 + 12M =$$

$$= \underline{\underline{\frac{1}{6}[48M^3 - 120M^2 + 72M]}}$$

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ersten Zeile ein Faktor von A_M.
Spalte über ab und auf diese
mit dem Cofaktor wie vorher
usw. usw.

$$\begin{vmatrix} \alpha & \xi & 0 & \cdots \\ 1 & \alpha & \xi & \cdots \\ \eta & 1 & \alpha & \cdots \\ \eta^2 & \eta & 1 & \cdots \\ \vdots & \vdots & \vdots & \end{vmatrix} = \begin{vmatrix} \alpha & 0 & \cdots & \\ 1 & \alpha - \frac{\xi}{\alpha} & \xi & 0 \\ \eta & 1 - \frac{\xi\eta}{\alpha} & \alpha & \xi \\ \eta^2 & \eta\left(1 - \frac{\xi\eta}{\alpha}\right) & 1 & \alpha & \cdots \\ \vdots & \vdots & & \end{vmatrix}$$

$$\xi - k\alpha = 0$$

$$k = \xi / \alpha$$

$$= \alpha \cdot \begin{vmatrix} \left(\frac{\alpha^2 - \xi}{\alpha}\right) & \xi & 0 & \cdots \\ \left(1 - \frac{\xi\eta}{\alpha}\right) & \alpha & \xi & \cdots \\ \eta\left(1 - \frac{\xi\eta}{\alpha}\right) & 1 & \alpha & \cdots \end{vmatrix} =$$

$$\xi - m \frac{\alpha^2 - \xi}{\alpha} = 0$$

$$m = \frac{\alpha \xi}{\alpha^2 - \xi}$$

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coeff x^{N-6}:

Typ

aaa $\binom{2M}{3} = \frac{1}{6} 2M(2M-1)(2M-2) =$

$= \frac{1}{6}(8M^3 - 12M^2 + 4M);$

aab $\binom{2M}{2}(4M-4) = \frac{1}{2} 2M(2M-1)(4M-4)$

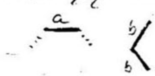
$= \frac{1}{6} 6M(2M-1)(4M-4) =$

$= \frac{1}{6} 24M \underbrace{(2M-1)(M-1)}_{2M^2-3M+1} = \frac{1}{6}(48M^3 - 72M^2 + 24M)$

aac $\binom{M}{2} M = \frac{1}{2} 2M(2M-1)M = \frac{1}{6} 6M^2(2M-1) =$

$= \frac{1}{6}[12M^3 - 6M^2]$

abb $2M\left\{\binom{4M-2}{2} - 2(M-1)\right\} = 2M\{(2M-1)(4M-3) - (2M-2)\} =$

darin sind mitgezählt
Anordng wie 
sie $2(M-1)$ mal vor!

$= 2M\{(8M^2 - 10M + 3) - 2M + 2\} =$

$= 2M[8M^2 - 12M + 5] = 16M^3 - 24M^2 + 10M$

$= \frac{1}{6}[96M^3 - 144M^2 + 60M]$

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$$\boxed{a_M = -\sum_{\nu=0} \alpha^{\nu}\, T_{M-1-\nu}}$$

vergleich mit § 5, (3), nämlich:

$$\boxed{a_M = \sum_{\nu=0} (-\tau)^{\nu}\, \Lambda_{M-1-\nu}}$$

ist in Hinblick auf § 4, 3) befriedigend:

$$a_M = -\sum \alpha^{\nu} \left[- P_{M-1-\nu}(-\tau, -\alpha \,|\, \rho, \sigma)\right]$$

$$= \sum \alpha^{\nu} \left[P_{M-1-\nu}(-\tau, -\alpha \,|\, \rho, \sigma)\right]$$

Ersatz: $\begin{pmatrix} \alpha \\ \tau \end{pmatrix} \Longleftrightarrow \begin{pmatrix} -\tau \\ -\alpha \end{pmatrix}$

ergibt:

$$a_M = \sum (-\tau)^{\nu}\, P_{M-1-\nu}(\alpha, \tau \,|\, \rho, \sigma) =$$

$$= \sum (-\tau)^{\nu}\, A_{M-1-\nu}$$

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(9

$$A_5 = \begin{vmatrix} \alpha & \xi & 0 & 0 & 0 \\ 1 & \alpha & \xi & 0 & 0 \\ \eta & 1 & \alpha & \xi & 0 \\ \eta^2 & \eta & 1 & \alpha & \xi \\ \eta^3 & \eta^2 & \eta & 1 & \alpha \end{vmatrix} =$$

$$\begin{array}{l|l} 12 & 345 \; + \\ 13 & 245 \; - \\ 23 & 145 \; + \end{array}$$

$$= (\alpha^2 - \xi)(\alpha^3 - 2\xi\alpha + \xi^2\eta) - \alpha\xi \begin{vmatrix} 1 & \xi & 0 \\ \eta & \alpha & \xi \\ \eta^2 & 1 & \alpha \end{vmatrix} + \xi^2 \begin{vmatrix} \eta & \xi & 0 \\ \eta^2 & \alpha & \xi \\ \eta^3 & 1 & \alpha \end{vmatrix} =$$

$$= (\alpha^2 - \xi)(\alpha^3 - 2\xi\alpha + \xi^2\eta) - (\alpha\xi - \xi^2\eta)(\alpha^2 + \xi^2\eta^2 - \xi - \xi\eta\alpha) =$$

$$= (\alpha^2 - \rho\sigma)(\alpha^3 - 2\rho\sigma\alpha + \rho\sigma\tau) - \rho\sigma(\alpha - \tau)(\alpha^2 + \tau^2 - \rho\sigma - \alpha\tau) =$$

$$= \alpha^5 + \rho\sigma \begin{pmatrix} -2\alpha^3 + \alpha^2\tau \\ -\alpha^3 \\ -\alpha^3 + \alpha^2\tau - \alpha\tau^2 \\ \quad + \alpha^2\tau - \alpha\tau^2 + \tau^3 \end{pmatrix} + \rho^2\sigma^2 \begin{pmatrix} 2\alpha - \tau \\ \alpha \\ -\tau \end{pmatrix} =$$

$$= \alpha^5 - \rho\sigma(4\alpha^3 - 3\alpha^2\tau + 2\alpha\tau^2 - \tau^3) +$$
$$+ \rho^2\sigma^2(3\alpha - 2\tau) = A_5 \quad \text{OK}$$

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