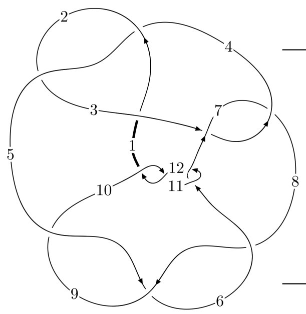
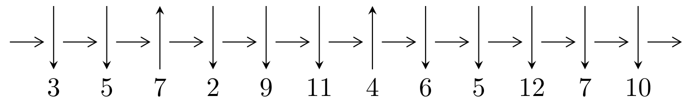
$12n_{0179}$ ($K12n_{0179}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$6,11 \xrightarrow[c_6]{} 4,7 \xrightarrow[c_7]{} 8 \xrightarrow[c_8]{} 9 \xrightarrow[c_{11}]{} 12 \xrightarrow[c_3]{} 3 \xrightarrow[c_5]{} 5 \xrightarrow[c_2]{} 2 \xrightarrow[c_{10}]{} 10 \xrightarrow[c_{12}]{} 1 \twoheadrightarrow c_1, c_4, c_9$$

Ideals for irreducible components[2] of X_{par}

$$\begin{aligned}
I_1^u = \langle & 1.37190 \times 10^{18} u^{22} - 7.99565 \times 10^{18} u^{21} + \cdots + 2.02541 \times 10^{20} b - 2.79533 \times 10^{20}, \\
& - 4.59710 \times 10^{19} u^{22} - 4.62744 \times 10^{20} u^{21} + \cdots + 3.44319 \times 10^{21} a - 1.63572 \times 10^{22}, \\
& u^{23} + 2u^{22} + \cdots + 52u + 17 \rangle \\
I_2^u = \langle & -5u^3a^2 - 3a^2u^2 + 6u^3a + 18a^2u + 11u^2a - 4u^3 - 4a^2 - 29au - 32u^2 + 37b - 10a + 7u + 19, \\
& 2u^3a^2 + 2a^2u^2 - u^3a + a^3 + a^2u + 2u^3 - 2a^2 - au + 3u^2 + 4u + 2,\ u^4 - u^2 + 1 \rangle \\
I_3^u = \langle & u^3 - u^2 + b + 1,\ u^4 - u^2 + a + 2u + 1,\ u^5 - u^4 + u^2 + u - 1 \rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 40 representations.

[1] The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

[2] All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I. $\boldsymbol{I^u_1 = \langle 1.37 \times 10^{18} u^{22} - 8.00 \times 10^{18} u^{21} + \cdots + 2.03 \times 10^{20} b - 2.80 \times 10^{20},\ -4.60 \times 10^{19} u^{22} - 4.63 \times 10^{20} u^{21} + \cdots + 3.44 \times 10^{21} a - 1.64 \times 10^{22},\ u^{23} + 2u^{22} + \cdots + 52u + 17\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.0133513u^{22} + 0.134394u^{21} + \cdots - 1.65131u + 4.75059 \\ -0.00677343u^{22} + 0.0394767u^{21} + \cdots - 0.213063u + 1.38013 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.415260u^{22} - 0.446011u^{21} + \cdots - 13.3132u - 7.56780 \\ -0.164479u^{22} - 0.153676u^{21} + \cdots - 4.53967u - 2.55254 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.250781u^{22} - 0.292335u^{21} + \cdots - 8.77357u - 5.01526 \\ -0.164479u^{22} - 0.153676u^{21} + \cdots - 4.53967u - 2.55254 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -0.158366u^{22} - 0.0384582u^{21} + \cdots - 7.26516u + 1.53971 \\ -0.184168u^{22} - 0.141177u^{21} + \cdots - 6.16412u - 1.51976 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.191837u^{22} + 0.133885u^{21} + \cdots + 5.40801u + 3.14823 \\ 0.0435720u^{22} + 0.0231293u^{21} + \cdots + 1.06482u + 0.103017 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.0136483u^{22} + 0.162115u^{21} + \cdots - 1.72543u + 5.96673 \\ -0.0408799u^{22} + 0.00329935u^{21} + \cdots - 0.954342u + 0.923420 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^5 - u \\ -u^7 + u^5 - 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{4518370331258650368 3}{10127043928445475225 8}u^{22} + \frac{93456001880784428205}{101270439284454752258}u^{21} + \cdots + \frac{88029374425623385430 6}{50635219642227376129}u + \frac{60197214472574386175 7}{50635219642227376129}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{23} + 28u^{22} + \cdots - 74u + 1$
c_2, c_4	$u^{23} - 10u^{22} + \cdots + 22u - 1$
c_3, c_7	$u^{23} - u^{22} + \cdots - 64u - 32$
c_5, c_8, c_9	$u^{23} - 2u^{22} + \cdots - 238u - 49$
c_6, c_{11}	$u^{23} - 2u^{22} + \cdots + 52u - 17$
c_{10}, c_{12}	$u^{23} + 18u^{22} + \cdots + 3418u + 289$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{23} - 104y^{22} + \cdots - 62214y - 1$
c_2, c_4	$y^{23} - 28y^{22} + \cdots - 74y - 1$
c_3, c_7	$y^{23} + 21y^{22} + \cdots + 37376y - 1024$
c_5, c_8, c_9	$y^{23} + 30y^{21} + \cdots + 31556y - 2401$
c_6, c_{11}	$y^{23} - 18y^{22} + \cdots + 3418y - 289$
c_{10}, c_{12}	$y^{23} - 18y^{22} + \cdots + 2928914y - 83521$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.030250 + 0.133808I$ $a = 0.762093 + 1.177250I$ $b = -0.359850 + 0.929573I$	$3.40068 - 2.08292I$	$-6.94504 + 2.82033I$
$u = -1.030250 - 0.133808I$ $a = 0.762093 - 1.177250I$ $b = -0.359850 - 0.929573I$	$3.40068 + 2.08292I$	$-6.94504 - 2.82033I$
$u = 0.901962 + 0.543040I$ $a = 4.80515 + 0.32829I$ $b = 2.51685 + 4.97104I$	$-0.09172 - 2.05272I$	$13.5502 - 11.7426I$
$u = 0.901962 - 0.543040I$ $a = 4.80515 - 0.32829I$ $b = 2.51685 - 4.97104I$	$-0.09172 + 2.05272I$	$13.5502 + 11.7426I$
$u = -0.774138 + 0.517283I$ $a = -0.187723 - 0.729816I$ $b = -0.888501 - 0.210493I$	$1.78208 + 2.09879I$	$0.37186 - 4.32801I$
$u = -0.774138 - 0.517283I$ $a = -0.187723 + 0.729816I$ $b = -0.888501 + 0.210493I$	$1.78208 - 2.09879I$	$0.37186 + 4.32801I$
$u = -0.987737 + 0.455591I$ $a = 0.000748 - 1.386780I$ $b = 0.203991 - 0.922058I$	$3.17947 + 4.60678I$	$-8.98911 - 4.52953I$
$u = -0.987737 - 0.455591I$ $a = 0.000748 + 1.386780I$ $b = 0.203991 + 0.922058I$	$3.17947 - 4.60678I$	$-8.98911 + 4.52953I$
$u = 0.751562$ $a = -0.430119$ $b = 0.215899$	-1.11111	-8.83030
$u = 0.913312 + 0.995998I$ $a = -0.455968 - 0.165528I$ $b = 0.0273478 + 0.1092730I$	$8.77314 - 3.60069I$	$-8.75891 + 4.90863I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.913312 - 0.995998I$ $a = -0.455968 + 0.165528I$ $b = 0.0273478 - 0.1092730I$	$8.77314 + 3.60069I$	$-8.75891 - 4.90863I$
$u = -0.29230 + 1.39423I$ $a = 0.306239 - 0.296422I$ $b = 0.27422 - 1.73853I$	$-9.67128 - 5.78622I$	$-6.43045 + 2.03811I$
$u = -0.29230 - 1.39423I$ $a = 0.306239 + 0.296422I$ $b = 0.27422 + 1.73853I$	$-9.67128 + 5.78622I$	$-6.43045 - 2.03811I$
$u = 0.312134 + 0.458419I$ $a = -0.517712 - 0.280214I$ $b = 0.099441 + 0.699809I$	$-0.646445 - 1.161780I$	$-6.90693 + 5.27856I$
$u = 0.312134 - 0.458419I$ $a = -0.517712 + 0.280214I$ $b = 0.099441 - 0.699809I$	$-0.646445 + 1.161780I$	$-6.90693 - 5.27856I$
$u = -1.34978 + 0.77312I$ $a = -0.81654 + 1.45288I$ $b = 0.50785 + 1.97781I$	$-12.9726 + 13.2355I$	$-7.13536 - 5.53565I$
$u = -1.34978 - 0.77312I$ $a = -0.81654 - 1.45288I$ $b = 0.50785 - 1.97781I$	$-12.9726 - 13.2355I$	$-7.13536 + 5.53565I$
$u = -0.377835$ $a = 3.52955$ $b = 0.965970$	-2.11000	0.409770
$u = -1.59039 + 0.40688I$ $a = 0.35471 - 1.57413I$ $b = -0.18308 - 1.79179I$	$-6.97074 + 4.93755I$	$-7.69369 - 2.56266I$
$u = -1.59039 - 0.40688I$ $a = 0.35471 + 1.57413I$ $b = -0.18308 + 1.79179I$	$-6.97074 - 4.93755I$	$-7.69369 + 2.56266I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.78874$ $a = 0.851439$ $b = -0.299287$	-10.2305	-8.74930
$u = 1.81595 + 0.61002I$ $a = 0.714754 + 1.134980I$ $b = -0.13957 + 1.61563I$	$-16.2453 - 1.7569I$	$-8.47765 + 0.68383I$
$u = 1.81595 - 0.61002I$ $a = 0.714754 - 1.134980I$ $b = -0.13957 - 1.61563I$	$-16.2453 + 1.7569I$	$-8.47765 - 0.68383I$

II.

$\boldsymbol{I_2^u = \langle -5u^3a^2+6u^3a+\cdots-10a+19,\ 2u^3a^2-u^3a+\cdots-2a^2+2,\ u^4-u^2+1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}a\\0.135135a^2u^3-0.162162au^3+\cdots+0.270270a-0.513514\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-0.351351a^2u^3-0.378378au^3+\cdots+0.297297a+1.13514\\-u^3\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-0.351351a^2u^3-0.378378au^3+\cdots+0.297297a+1.13514\\-u^3\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.135135a^2u^3+0.162162au^3+\cdots+0.729730a+0.513514\\0.486486a^2u^3-0.783784au^3+\cdots-1.02703a+0.351351\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0.108108a^2u^3+0.270270au^3+\cdots+0.216216a+1.18919\\1\end{pmatrix}$$
$$a_2 = \begin{pmatrix}0.0270270a^2u^3+0.567568au^3+\cdots+0.0540541a+1.29730\\-0.189189a^2u^3+0.0270270au^3+\cdots-0.378378a+0.918919\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^3\\0\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $=$
$-\frac{100}{37}u^3a^2+\frac{88}{37}a^2u^2+\frac{120}{37}u^3a+\frac{64}{37}a^2u-\frac{76}{37}u^2a-\frac{80}{37}u^3-\frac{80}{37}a^2-\frac{136}{37}au+\frac{100}{37}u^2+\frac{96}{37}a+\frac{140}{37}u-\frac{212}{37}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^3 - u^2 + 2u - 1)^4$
c_2	$(u^3 + u^2 - 1)^4$
c_3, c_7	$(u^6 - 3u^4 + 2u^2 + 1)^2$
c_4	$(u^3 - u^2 + 1)^4$
c_5, c_8, c_9	$(u^2 + 1)^6$
c_6, c_{11}	$(u^4 - u^2 + 1)^3$
c_{10}	$(u^2 - u + 1)^6$
c_{12}	$(u^2 + u + 1)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^3+3y^2+2y-1)^4$
c_2, c_4	$(y^3-y^2+2y-1)^4$
c_3, c_7	$(y^3-3y^2+2y+1)^4$
c_5, c_8, c_9	$(y+1)^{12}$
c_6, c_{11}	$(y^2-y+1)^6$
c_{10}, c_{12}	$(y^2+y+1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = 0.611376 + 1.168210I$ $b = 0.60113 + 1.32865I$	$4.66906 + 0.79824I$	$-2.49024 + 0.48465I$
$u = 0.866025 + 0.500000I$ $a = -0.86134 - 1.84069I$ $b = -0.14373 - 1.45121I$	$4.66906 - 4.85801I$	$-2.49024 + 6.44355I$
$u = 0.866025 + 0.500000I$ $a = 0.38394 - 3.55957I$ $b = 3.27465 - 0.87744I$	$0.53148 - 2.02988I$	$-9.01951 + 3.46410I$
$u = 0.866025 - 0.500000I$ $a = 0.611376 - 1.168210I$ $b = 0.60113 - 1.32865I$	$4.66906 - 0.79824I$	$-2.49024 - 0.48465I$
$u = 0.866025 - 0.500000I$ $a = -0.86134 + 1.84069I$ $b = -0.14373 + 1.45121I$	$4.66906 + 4.85801I$	$-2.49024 - 6.44355I$
$u = 0.866025 - 0.500000I$ $a = 0.38394 + 3.55957I$ $b = 3.27465 + 0.87744I$	$0.53148 + 2.02988I$	$-9.01951 - 3.46410I$
$u = -0.866025 + 0.500000I$ $a = 0.801323 + 0.635627I$ $b = -0.356011 - 0.161073I$	$4.66906 - 0.79824I$	$-2.49024 - 0.48465I$
$u = -0.866025 + 0.500000I$ $a = -0.306233 - 0.883547I$ $b = 0.388851 + 0.038512I$	$4.66906 + 4.85801I$	$-2.49024 - 6.44355I$
$u = -0.866025 + 0.500000I$ $a = 1.37094 - 0.52003I$ $b = 0.235109 - 0.877439I$	$0.53148 + 2.02988I$	$-9.01951 - 3.46410I$
$u = -0.866025 - 0.500000I$ $a = 0.801323 - 0.635627I$ $b = -0.356011 + 0.161073I$	$4.66906 + 0.79824I$	$-2.49024 + 0.48465I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.866025 - 0.500000I$ $a = -0.306233 + 0.883547I$ $b = 0.388851 - 0.038512I$	$4.66906 - 4.85801I$	$-2.49024 + 6.44355I$
$u = -0.866025 - 0.500000I$ $a = 1.37094 + 0.52003I$ $b = 0.235109 + 0.877439I$	$0.53148 - 2.02988I$	$-9.01951 + 3.46410I$

III. $\boldsymbol{I_3^u = \langle u^3 - u^2 + b + 1,\ u^4 - u^2 + a + 2u + 1,\ u^5 - u^4 + u^2 + u - 1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^4 + u^2 - 2u - 1 \\ -u^3 + u^2 - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^4 + u^2 - 2u - 1 \\ -u^3 + u^2 - 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^4 - u^2 + 1 \\ -u^4 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -2u^4 + 2u^2 - 2u - 2 \\ u^4 - u^3 + u^2 - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^3 \\ u^4 - u^3 - u^2 + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^4 + u^2 - 1 \\ u^4 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -9u^4 + u^3 + 2u^2 - 4u - 17$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^5$
c_3, c_7	u^5
c_4	$(u+1)^5$
c_5, c_{10}	$u^5 - u^4 + 4u^3 - 3u^2 + 3u - 1$
c_6	$u^5 - u^4 + u^2 + u - 1$
c_8, c_9, c_{12}	$u^5 + u^4 + 4u^3 + 3u^2 + 3u + 1$
c_{11}	$u^5 + u^4 - u^2 + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^5$
c_3, c_7	y^5
c_5, c_8, c_9 c_{10}, c_{12}	$y^5 + 7y^4 + 16y^3 + 13y^2 + 3y - 1$
c_6, c_{11}	$y^5 - y^4 + 4y^3 - 3y^2 + 3y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.758138 + 0.584034I$ $a = 1.47956 - 1.63976I$ $b = -1.10636 - 1.69341I$	$0.17487 + 2.21397I$	$-6.59361 + 0.42541I$
$u = -0.758138 - 0.584034I$ $a = 1.47956 + 1.63976I$ $b = -1.10636 + 1.69341I$	$0.17487 - 2.21397I$	$-6.59361 - 0.42541I$
$u = 0.935538 + 0.903908I$ $a = 0.044146 - 0.313338I$ $b = 0.532511 + 0.056433I$	$9.31336 - 3.33174I$	$3.61324 - 0.36944I$
$u = 0.935538 - 0.903908I$ $a = 0.044146 + 0.313338I$ $b = 0.532511 - 0.056433I$	$9.31336 + 3.33174I$	$3.61324 + 0.36944I$
$u = 0.645200$ $a = -2.04741$ $b = -0.852303$	-2.52712	-20.0390

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^5)(u^3-u^2+2u-1)^4(u^{23}+28u^{22}+\cdots-74u+1)$
c_2	$((u-1)^5)(u^3+u^2-1)^4(u^{23}-10u^{22}+\cdots+22u-1)$
c_3, c_7	$u^5(u^6-3u^4+2u^2+1)^2(u^{23}-u^{22}+\cdots-64u-32)$
c_4	$((u+1)^5)(u^3-u^2+1)^4(u^{23}-10u^{22}+\cdots+22u-1)$
c_5	$((u^2+1)^6)(u^5-u^4+\cdots+3u-1)(u^{23}-2u^{22}+\cdots-238u-49)$
c_6	$((u^4-u^2+1)^3)(u^5-u^4+u^2+u-1)(u^{23}-2u^{22}+\cdots+52u-17)$
c_8, c_9	$((u^2+1)^6)(u^5+u^4+\cdots+3u+1)(u^{23}-2u^{22}+\cdots-238u-49)$
c_{10}	$(u^2-u+1)^6(u^5-u^4+4u^3-3u^2+3u-1)$ $\cdot(u^{23}+18u^{22}+\cdots+3418u+289)$
c_{11}	$((u^4-u^2+1)^3)(u^5+u^4-u^2+u+1)(u^{23}-2u^{22}+\cdots+52u-17)$
c_{12}	$(u^2+u+1)^6(u^5+u^4+4u^3+3u^2+3u+1)$ $\cdot(u^{23}+18u^{22}+\cdots+3418u+289)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^5)(y^3+3y^2+2y-1)^4(y^{23}-104y^{22}+\cdots-62214y-1)$
c_2, c_4	$((y-1)^5)(y^3-y^2+2y-1)^4(y^{23}-28y^{22}+\cdots-74y-1)$
c_3, c_7	$y^5(y^3-3y^2+2y+1)^4(y^{23}+21y^{22}+\cdots+37376y-1024)$
c_5, c_8, c_9	$(y+1)^{12}(y^5+7y^4+16y^3+13y^2+3y-1)$ $\cdot(y^{23}+30y^{21}+\cdots+31556y-2401)$
c_6, c_{11}	$(y^2-y+1)^6(y^5-y^4+4y^3-3y^2+3y-1)$ $\cdot(y^{23}-18y^{22}+\cdots+3418y-289)$
c_{10}, c_{12}	$(y^2+y+1)^6(y^5+7y^4+16y^3+13y^2+3y-1)$ $\cdot(y^{23}-18y^{22}+\cdots+2928914y-83521)$