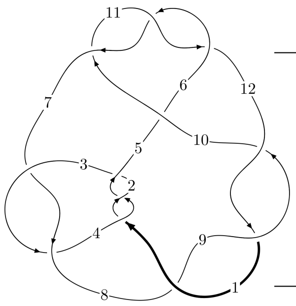
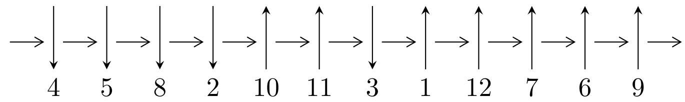
$12a_{0827}$ $(K12a_{0827})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^{53} + u^{52} + \cdots + b - 3u,\ -u^{53} + u^{52} + \cdots + a + 1,\ u^{56} - 2u^{55} + \cdots - u - 1\rangle$$
$$I_2^u = \langle -u^2 + b - 1,\ a - 1,\ u^3 + 2u - 1\rangle$$
$$I_3^u = \langle u^3 + u^2 + b + u + 1,\ a + u + 1,\ u^4 + u^3 + 2u^2 + 2u + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 63 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.

$$I_1^u = \langle u^{53}+u^{52}+\cdots+b-3u,\ -u^{53}+u^{52}+\cdots+a+1,\ u^{56}-2u^{55}+\cdots-u-1\rangle$$

(i) Arc colorings

$$a_6 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}u^{53}-u^{52}+\cdots+5u-1\\-u^{53}-u^{52}+\cdots-2u^2+3u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u^{12}-5u^{10}-7u^8+2u^4-3u^2+1\\u^{12}+6u^{10}+12u^8+8u^6+u^4+2u^2\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^2+1\\u^4+2u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^5-2u^3-u\\-u^7-3u^5-2u^3+u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-u^{50}+u^{49}+\cdots+3u-2\\-u^{52}+u^{51}+\cdots-3u^2+2u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^{53}+u^{52}+\cdots+u-2\\u^{53}-u^{52}+\cdots-5u^2+2u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^4-u^2+1\\u^4+2u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^8+3u^6+u^4-2u^2+1\\-u^8-4u^6-4u^4\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^{55}-8u^{54}+\cdots+41u+1$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{56} - 8u^{55} + \cdots + 4u - 1$
c_3, c_7	$u^{56} - u^{55} + \cdots + 64u + 128$
c_5	$u^{56} + 2u^{55} + \cdots - 6840u - 1480$
c_6, c_{10}, c_{11}	$u^{56} - 2u^{55} + \cdots - u - 1$
c_8, c_9, c_{12}	$u^{56} + 6u^{55} + \cdots + 15u + 19$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{56} - 60y^{55} + \cdots + 20y + 1$
c_3, c_7	$y^{56} - 45y^{55} + \cdots - 77824y + 16384$
c_5	$y^{56} + 30y^{55} + \cdots + 5106160y + 2190400$
c_6, c_{10}, c_{11}	$y^{56} + 54y^{55} + \cdots - 21y + 1$
c_8, c_9, c_{12}	$y^{56} + 66y^{55} + \cdots - 9725y + 361$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.660832 + 0.532382I$ $a = -2.01116 - 0.10615I$ $b = -0.35051 - 2.14768I$	$-15.9022 - 5.0365I$	$-5.83411 + 0.48302I$
$u = \ \ 0.660832 - 0.532382I$ $a = -2.01116 + 0.10615I$ $b = -0.35051 + 2.14768I$	$-15.9022 + 5.0365I$	$-5.83411 - 0.48302I$
$u = \ \ 0.708316 + 0.463836I$ $a = \ \ 1.259210 + 0.179633I$ $b = \ \ 0.37444 + 2.69166I$	$-15.6591 + 9.6036I$	$-5.25563 - 6.20278I$
$u = \ \ 0.708316 - 0.463836I$ $a = \ \ 1.259210 - 0.179633I$ $b = \ \ 0.37444 - 2.69166I$	$-15.6591 - 9.6036I$	$-5.25563 + 6.20278I$
$u = -0.676559 + 0.489617I$ $a = -0.386353 + 0.785496I$ $b = \ \ 1.073820 - 0.154726I$	$-10.73890 - 2.24941I$	$-4.62574 + 2.95001I$
$u = -0.676559 - 0.489617I$ $a = -0.386353 - 0.785496I$ $b = \ \ 1.073820 + 0.154726I$	$-10.73890 + 2.24941I$	$-4.62574 - 2.95001I$
$u = \ \ 0.682129 + 0.475711I$ $a = -1.55512 - 0.39032I$ $b = -0.49146 - 2.66606I$	$-8.46348 + 5.18228I$	$-3.67010 - 5.70178I$
$u = \ \ 0.682129 - 0.475711I$ $a = -1.55512 + 0.39032I$ $b = -0.49146 + 2.66606I$	$-8.46348 - 5.18228I$	$-3.67010 + 5.70178I$
$u = \ \ 0.664199 + 0.499108I$ $a = \ \ 1.88326 + 0.30058I$ $b = \ \ 0.59126 + 2.40754I$	$-8.55005 - 0.70692I$	$-4.00146 - 0.24980I$
$u = \ \ 0.664199 - 0.499108I$ $a = \ \ 1.88326 - 0.30058I$ $b = \ \ 0.59126 - 2.40754I$	$-8.55005 + 0.70692I$	$-4.00146 + 0.24980I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.185528 + 1.194610I$ $a = 1.15155 + 1.06757I$ $b = -0.869359 - 0.937264I$	$-7.53088 + 3.11306I$	0
$u = 0.185528 - 1.194610I$ $a = 1.15155 - 1.06757I$ $b = -0.869359 + 0.937264I$	$-7.53088 - 3.11306I$	0
$u = -0.634915 + 0.454764I$ $a = 0.148473 - 0.390436I$ $b = -0.506435 + 0.067605I$	$-3.97803 - 2.08824I$	$3.15083 + 3.45018I$
$u = -0.634915 - 0.454764I$ $a = 0.148473 + 0.390436I$ $b = -0.506435 - 0.067605I$	$-3.97803 + 2.08824I$	$3.15083 - 3.45018I$
$u = 0.066056 + 1.253010I$ $a = -1.231350 - 0.008674I$ $b = 1.006180 + 0.304650I$	$-2.42783 + 1.72439I$	0
$u = 0.066056 - 1.253010I$ $a = -1.231350 + 0.008674I$ $b = 1.006180 - 0.304650I$	$-2.42783 - 1.72439I$	0
$u = -0.658902 + 0.263840I$ $a = -0.849914 + 0.073788I$ $b = 0.44012 + 1.55766I$	$-6.76817 - 5.79426I$	$-2.57901 + 6.54647I$
$u = -0.658902 - 0.263840I$ $a = -0.849914 - 0.073788I$ $b = 0.44012 - 1.55766I$	$-6.76817 + 5.79426I$	$-2.57901 - 6.54647I$
$u = -0.355604 + 0.604584I$ $a = 1.27737 + 1.18185I$ $b = 0.176477 - 1.192730I$	$-8.09448 + 2.23237I$	$-6.24032 - 0.17719I$
$u = -0.355604 - 0.604584I$ $a = 1.27737 - 1.18185I$ $b = 0.176477 + 1.192730I$	$-8.09448 - 2.23237I$	$-6.24032 + 0.17719I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.032180 + 1.315600I$ $a = 1.65049 - 1.49020I$ $b = -1.72250 + 0.53274I$	$-5.16815 - 0.97608I$	0
$u = -0.032180 - 1.315600I$ $a = 1.65049 + 1.49020I$ $b = -1.72250 - 0.53274I$	$-5.16815 + 0.97608I$	0
$u = 0.140776 + 1.329860I$ $a = 0.112471 - 0.618255I$ $b = -0.251370 + 0.625724I$	$-3.44679 + 2.43795I$	0
$u = 0.140776 - 1.329860I$ $a = 0.112471 + 0.618255I$ $b = -0.251370 - 0.625724I$	$-3.44679 - 2.43795I$	0
$u = 0.650158$ $a = 0.687504$ $b = -0.940476$	-3.94742	0.365180
$u = -0.550030 + 0.257011I$ $a = 1.005750 - 0.053759I$ $b = 0.08417 - 1.41533I$	$-0.60546 - 3.13990I$	$0.90903 + 8.93719I$
$u = -0.550030 - 0.257011I$ $a = 1.005750 + 0.053759I$ $b = 0.08417 + 1.41533I$	$-0.60546 + 3.13990I$	$0.90903 - 8.93719I$
$u = -0.194330 + 1.384330I$ $a = 1.52389 + 1.96311I$ $b = -0.42665 - 1.78739I$	$-5.81737 - 5.85679I$	0
$u = -0.194330 - 1.384330I$ $a = 1.52389 - 1.96311I$ $b = -0.42665 + 1.78739I$	$-5.81737 + 5.85679I$	0
$u = -0.244927 + 1.385240I$ $a = -2.01842 - 1.29418I$ $b = 0.99243 + 1.48272I$	$-11.9991 - 9.0718I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.244927 - 1.385240I$ $a = -2.01842 + 1.29418I$ $b = 0.99243 - 1.48272I$	$-11.9991 + 9.0718I$	0
$u = -0.135589 + 1.401420I$ $a = -0.55425 - 2.40672I$ $b = -0.40949 + 1.76759I$	$-6.82917 - 1.43395I$	0
$u = -0.135589 - 1.401420I$ $a = -0.55425 + 2.40672I$ $b = -0.40949 - 1.76759I$	$-6.82917 + 1.43395I$	0
$u = 0.169908 + 1.402300I$ $a = -0.588451 + 0.710634I$ $b = 0.950712 - 1.025380I$	$-8.25453 + 3.79866I$	0
$u = 0.169908 - 1.402300I$ $a = -0.588451 - 0.710634I$ $b = 0.950712 + 1.025380I$	$-8.25453 - 3.79866I$	0
$u = 0.477090 + 0.308383I$ $a = 1.096420 + 0.178210I$ $b = 0.155533 - 0.573459I$	$-2.81186 + 1.40524I$	$-1.32654 - 4.47405I$
$u = 0.477090 - 0.308383I$ $a = 1.096420 - 0.178210I$ $b = 0.155533 + 0.573459I$	$-2.81186 - 1.40524I$	$-1.32654 + 4.47405I$
$u = -0.09346 + 1.46417I$ $a = 0.20672 + 1.99781I$ $b = 0.533413 - 1.285270I$	$-14.6540 + 0.7423I$	0
$u = -0.09346 - 1.46417I$ $a = 0.20672 - 1.99781I$ $b = 0.533413 + 1.285270I$	$-14.6540 - 0.7423I$	0
$u = -0.22823 + 1.47473I$ $a = 0.447474 - 0.510871I$ $b = -0.437565 + 0.216954I$	$-10.20770 - 5.24287I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.22823 - 1.47473I$ $a = 0.447474 + 0.510871I$ $b = -0.437565 - 0.216954I$	$-10.20770 + 5.24287I$	0
$u = 0.482677 + 0.077215I$ $a = -0.481205 - 0.248126I$ $b = 0.246960 + 0.272043I$	$0.970388 + 0.223799I$	$9.84475 - 1.11489I$
$u = 0.482677 - 0.077215I$ $a = -0.481205 + 0.248126I$ $b = 0.246960 - 0.272043I$	$0.970388 - 0.223799I$	$9.84475 + 1.11489I$
$u = 0.24142 + 1.49209I$ $a = -0.96174 + 3.18550I$ $b = -1.14574 - 3.47762I$	$-14.8427 + 8.5522I$	0
$u = 0.24142 - 1.49209I$ $a = -0.96174 - 3.18550I$ $b = -1.14574 + 3.47762I$	$-14.8427 - 8.5522I$	0
$u = 0.25422 + 1.49240I$ $a = 1.26227 - 3.10390I$ $b = 0.62907 + 3.47790I$	$17.4812 + 13.1175I$	0
$u = 0.25422 - 1.49240I$ $a = 1.26227 + 3.10390I$ $b = 0.62907 - 3.47790I$	$17.4812 - 13.1175I$	0
$u = 0.22938 + 1.49684I$ $a = 0.54325 - 2.87749I$ $b = 1.58029 + 2.89554I$	$-15.0303 + 2.5470I$	0
$u = 0.22938 - 1.49684I$ $a = 0.54325 + 2.87749I$ $b = 1.58029 - 2.89554I$	$-15.0303 - 2.5470I$	0
$u = -0.23625 + 1.49620I$ $a = -0.956299 + 1.041640I$ $b = 0.911847 - 0.439648I$	$-17.1840 - 5.5773I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.23625 - 1.49620I$ $a = -0.956299 - 1.041640I$ $b = 0.911847 + 0.439648I$	$-17.1840 + 5.5773I$	0
$u = -0.328861 + 0.345682I$ $a = -1.49250 - 0.54755I$ $b = -0.337925 + 0.940882I$	$-1.35678 + 0.40897I$	$-4.58141 + 0.13803I$
$u = -0.328861 - 0.345682I$ $a = -1.49250 + 0.54755I$ $b = -0.337925 - 0.940882I$	$-1.35678 - 0.40897I$	$-4.58141 - 0.13803I$
$u = 0.21901 + 1.50844I$ $a = -0.60237 + 2.27231I$ $b = -1.30465 - 2.19638I$	$16.9245 - 1.8446I$	0
$u = 0.21901 - 1.50844I$ $a = -0.60237 - 2.27231I$ $b = -1.30465 + 2.19638I$	$16.9245 + 1.8446I$	0
$u = -0.273566$ $a = -2.44641$ $b = -1.04562$	-1.24400	-12.1870

II. $\boldsymbol{I^u_2 = \langle -u^2 + b - 1,\ a - 1,\ u^3 + 2u - 1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 + 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^2 + 1 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^2 - u \\ u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^2 + u + 1 \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ u^2 + 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^2 - u + 1 \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + u \\ -u^2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 7u^2 + 5u + 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.22670 + 1.46771I$ $a = \quad 1.00000$ $b = -1.102790 - 0.665457I$	$-11.08570 - 5.13794I$	$-9.85299 + 2.68036I$
$u = -0.22670 - 1.46771I$ $a = \quad 1.00000$ $b = -1.102790 + 0.665457I$	$-11.08570 + 5.13794I$	$-9.85299 - 2.68036I$
$u = \quad 0.453398$ $a = \quad 1.00000$ $b = \quad 1.20557$	-0.857735	9.70600

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

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u - 1 \\ -u^3 - u^2 - u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^2 + 1 \\ -u^3 - 2u - 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^3 - 2u - 1 \\ -u^3 - u^2 - u - 2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^3 + u \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u - 1 \\ -u^3 - u^2 - u - 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^3 + u^2 + 2u + 2 \\ -u^3 - 2u - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3 + 2u + 1 \\ u^3 + u^2 + u + 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^3 - 2u^2 + 2u - 5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_3	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.621744 + 0.440597I$ $a = -0.378256 - 0.440597I$ $b = -0.692440 - 0.318148I$	$-4.93480 - 2.02988I$	$-6.26314 + 3.25323I$
$u = -0.621744 - 0.440597I$ $a = -0.378256 + 0.440597I$ $b = -0.692440 + 0.318148I$	$-4.93480 + 2.02988I$	$-6.26314 - 3.25323I$
$u = 0.121744 + 1.306620I$ $a = -1.12174 - 1.30662I$ $b = 1.192440 + 0.547877I$	$-4.93480 + 2.02988I$	$-3.23686 - 4.54099I$
$u = 0.121744 - 1.306620I$ $a = -1.12174 + 1.30662I$ $b = 1.192440 - 0.547877I$	$-4.93480 - 2.02988I$	$-3.23686 + 4.54099I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^7)(u^{56} - 8u^{55} + \cdots + 4u - 1)$
c_3, c_7	$u^7(u^{56} - u^{55} + \cdots + 64u + 128)$
c_4	$((u+1)^7)(u^{56} - 8u^{55} + \cdots + 4u - 1)$
c_5	$((u^2 - u + 1)^2)(u^3 + 3u^2 + 5u + 2)(u^{56} + 2u^{55} + \cdots - 6840u - 1480)$
c_6	$(u^3 + 2u + 1)(u^4 - u^3 + 2u^2 - 2u + 1)(u^{56} - 2u^{55} + \cdots - u - 1)$
c_8, c_9	$(u^3 + 2u + 1)(u^4 - u^3 + 2u^2 - 2u + 1)(u^{56} + 6u^{55} + \cdots + 15u + 19)$
c_{10}, c_{11}	$(u^3 + 2u - 1)(u^4 + u^3 + 2u^2 + 2u + 1)(u^{56} - 2u^{55} + \cdots - u - 1)$
c_{12}	$(u^3 + 2u - 1)(u^4 + u^3 + 2u^2 + 2u + 1)(u^{56} + 6u^{55} + \cdots + 15u + 19)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y-1)^7)(y^{56} - 60y^{55} + \cdots + 20y + 1)$
c_3, c_7	$y^7(y^{56} - 45y^{55} + \cdots - 77824y + 16384)$
c_5	$(y^2 + y + 1)^2(y^3 + y^2 + 13y - 4)$ $\cdot (y^{56} + 30y^{55} + \cdots + 5106160y + 2190400)$
c_6, c_{10}, c_{11}	$(y^3 + 4y^2 + 4y - 1)(y^4 + 3y^3 + 2y^2 + 1)(y^{56} + 54y^{55} + \cdots - 21y + 1)$
c_8, c_9, c_{12}	$(y^3 + 4y^2 + 4y - 1)(y^4 + 3y^3 + 2y^2 + 1)(y^{56} + 66y^{55} + \cdots - 9725y + 361)$