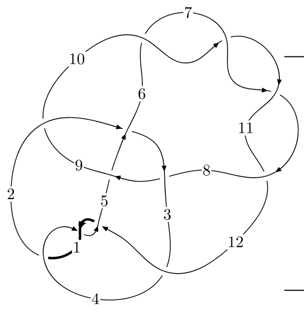
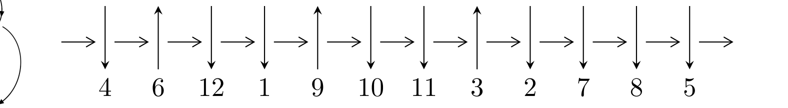
$12a_{1009}$ $(K12a_{1009})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$7{,}10 \xrightarrow[c_{10}]{} 11 \xrightarrow[c_{7}]{} 8 \xrightarrow[c_{11}]{} 12 \xrightarrow[c_{6}]{} 2{,}6 \xrightarrow[c_{2}]{} 3 \xrightarrow[c_{3}]{} 4 \xrightarrow[c_{1}]{} 1 \xrightarrow[c_{9}]{} 9 \xrightarrow[c_{5}]{} 5 \twoheadrightarrow c_4, c_8, c_{12}$$

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

$$\begin{aligned} I^u_1 = \langle &-2.83377 \times 10^{70} u^{70} - 9.54793 \times 10^{70} u^{69} + \cdots + 1.77999 \times 10^{69} b + 4.28601 \times 10^{70}, \\ &- 1.01200 \times 10^{71} u^{70} - 3.39563 \times 10^{71} u^{69} + \cdots + 5.33996 \times 10^{69} a + 1.38029 \times 10^{71}, \\ &u^{71} + 4u^{70} + \cdots - 11u - 1 \rangle \\ I^u_2 = \langle &b - a,\ a^3 - a^2 + 1,\ u + 1 \rangle \end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 74 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. $I^u_1 = \langle -2.83\times10^{70}u^{70} - 9.55\times10^{70}u^{69} + \cdots + 1.78\times10^{69}b + 4.29\times10^{70},\ -1.01\times10^{71}u^{70} - 3.40\times10^{71}u^{69} + \cdots + 5.34\times10^{69}a + 1.38\times10^{71},\ u^{71} + 4u^{70} + \cdots - 11u - 1\rangle$

(i) Arc colorings

$$a_7 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}18.9514u^{70} + 63.5891u^{69} + \cdots - 271.927u - 25.8484\\15.9202u^{70} + 53.6404u^{69} + \cdots - 234.194u - 24.0789\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}17.2006u^{70} + 58.3127u^{69} + \cdots - 251.019u - 23.6721\\14.1693u^{70} + 48.3641u^{69} + \cdots - 213.286u - 21.9026\end{pmatrix}$$
$$a_4 = \begin{pmatrix}19.8181u^{70} + 66.3472u^{69} + \cdots - 282.283u - 27.5349\\18.5251u^{70} + 62.2805u^{69} + \cdots - 268.012u - 27.5305\end{pmatrix}$$
$$a_1 = \begin{pmatrix}1.01917u^{70} + 3.16140u^{69} + \cdots - 3.40337u + 1.44731\\1.16536u^{70} + 3.78779u^{69} + \cdots - 5.87924u - 0.221025\end{pmatrix}$$
$$a_9 = \begin{pmatrix}5.05082u^{70} + 17.2412u^{69} + \cdots - 52.3212u - 5.84505\\6.62995u^{70} + 22.6456u^{69} + \cdots - 101.441u - 10.8064\end{pmatrix}$$
$$a_5 = \begin{pmatrix}2.46549u^{70} + 7.58181u^{69} + \cdots - 26.3911u - 4.12137\\2.46549u^{70} + 7.58181u^{69} + \cdots - 26.3911u - 3.12137\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -97.9174u^{70} - 336.151u^{69} + \cdots + 1510.09u + 154.499$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_{12}	$u^{71} - 2u^{70} + \cdots - 8u - 1$
c_2	$u^{71} - 5u^{70} + \cdots + 12u - 8$
c_3	$u^{71} + 2u^{70} + \cdots - 14304u - 929$
c_5	$u^{71} - 4u^{70} + \cdots + 3u - 1$
c_6, c_7, c_{10} c_{11}	$u^{71} + 4u^{70} + \cdots - 11u - 1$
c_8	$u^{71} - 22u^{69} + \cdots - 460924u - 201793$
c_9	$u^{71} - 2u^{70} + \cdots - 1978u - 169$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_{12}	$y^{71} + 60y^{70} + \cdots + 40y - 1$
c_2	$y^{71} + 21y^{70} + \cdots + 720y - 64$
c_3	$y^{71} - 36y^{70} + \cdots + 30160512y - 863041$
c_5	$y^{71} + 2y^{70} + \cdots - 3y - 1$
c_6, c_7, c_{10} c_{11}	$y^{71} - 86y^{70} + \cdots - 3y - 1$
c_8	$y^{71} - 44y^{70} + \cdots - 833663350352y - 40720414849$
c_9	$y^{71} - 96y^{70} + \cdots + 7503396y - 28561$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.916330 + 0.404967I$ $a = 1.41839 - 0.68949I$ $b = 1.089920 + 0.667509I$	$-2.48396 - 4.29702I$	0
$u = 0.916330 - 0.404967I$ $a = 1.41839 + 0.68949I$ $b = 1.089920 - 0.667509I$	$-2.48396 + 4.29702I$	0
$u = -0.797905 + 0.667654I$ $a = 0.407468 + 0.747440I$ $b = 0.939564 + 0.123379I$	$-0.64412 + 3.87490I$	0
$u = -0.797905 - 0.667654I$ $a = 0.407468 - 0.747440I$ $b = 0.939564 - 0.123379I$	$-0.64412 - 3.87490I$	0
$u = 0.919544 + 0.509968I$ $a = -1.38427 + 0.50220I$ $b = -1.18719 - 0.81000I$	$-4.93660 - 8.62281I$	0
$u = 0.919544 - 0.509968I$ $a = -1.38427 - 0.50220I$ $b = -1.18719 + 0.81000I$	$-4.93660 + 8.62281I$	0
$u = 0.899669 + 0.567468I$ $a = 1.343630 - 0.396527I$ $b = 1.21545 + 0.90921I$	$0.03199 - 12.75630I$	0
$u = 0.899669 - 0.567468I$ $a = 1.343630 + 0.396527I$ $b = 1.21545 - 0.90921I$	$0.03199 + 12.75630I$	0
$u = -0.902665 + 0.602685I$ $a = -0.299774 - 0.774692I$ $b = -0.802092 - 0.207826I$	$-4.42813 + 0.27103I$	0
$u = -0.902665 - 0.602685I$ $a = -0.299774 + 0.774692I$ $b = -0.802092 + 0.207826I$	$-4.42813 - 0.27103I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.16620$ $a = -0.362381$ $b = 0.0637371$	-2.18683	0
$u = -1.013430 + 0.583657I$ $a = 0.183762 + 0.842968I$ $b = 0.696701 + 0.328940I$	$-0.31480 - 3.35362I$	0
$u = -1.013430 - 0.583657I$ $a = 0.183762 - 0.842968I$ $b = 0.696701 - 0.328940I$	$-0.31480 + 3.35362I$	0
$u = 0.811667 + 0.167450I$ $a = 1.56180 - 1.25295I$ $b = 0.749957 + 0.379899I$	$-1.94355 - 3.45136I$	0
$u = 0.811667 - 0.167450I$ $a = 1.56180 + 1.25295I$ $b = 0.749957 - 0.379899I$	$-1.94355 + 3.45136I$	0
$u = 0.012443 + 0.826554I$ $a = 0.185238 - 0.013310I$ $b = -0.906553 + 0.727576I$	$2.73486 + 8.14282I$	0
$u = 0.012443 - 0.826554I$ $a = 0.185238 + 0.013310I$ $b = -0.906553 - 0.727576I$	$2.73486 - 8.14282I$	0
$u = 0.788810 + 0.056736I$ $a = -2.20931 - 1.28447I$ $b = -0.586607 - 0.039795I$	$-3.91288 - 1.17863I$	$-20.7772 + 5.1029I$
$u = 0.788810 - 0.056736I$ $a = -2.20931 + 1.28447I$ $b = -0.586607 + 0.039795I$	$-3.91288 + 1.17863I$	$-20.7772 - 5.1029I$
$u = 0.750230 + 0.210776I$ $a = 2.28809 + 0.97667I$ $b = 0.475905 + 0.328068I$	$1.15173 - 5.50599I$	$-6.00000 + 10.13859I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.750230 - 0.210776I$ $a = 2.28809 - 0.97667I$ $b = 0.475905 - 0.328068I$	$1.15173 + 5.50599I$	$-6.00000 - 10.13859I$
$u = -0.057589 + 0.774983I$ $a = -0.130444 + 0.204956I$ $b = 0.917161 - 0.614056I$	$-1.95781 + 4.36004I$	$-9.73775 - 6.33857I$
$u = -0.057589 - 0.774983I$ $a = -0.130444 - 0.204956I$ $b = 0.917161 + 0.614056I$	$-1.95781 - 4.36004I$	$-9.73775 + 6.33857I$
$u = 0.642028 + 0.410757I$ $a = -0.750353 + 0.843964I$ $b = -0.684830 - 0.915401I$	$5.36047 - 4.61297I$	$-2.63206 + 7.81095I$
$u = 0.642028 - 0.410757I$ $a = -0.750353 - 0.843964I$ $b = -0.684830 + 0.915401I$	$5.36047 + 4.61297I$	$-2.63206 - 7.81095I$
$u = -0.221305 + 0.702040I$ $a = -0.093157 - 0.497861I$ $b = -0.965469 + 0.417790I$	$0.956547 + 0.819716I$	$-7.05042 - 3.17652I$
$u = -0.221305 - 0.702040I$ $a = -0.093157 + 0.497861I$ $b = -0.965469 - 0.417790I$	$0.956547 - 0.819716I$	$-7.05042 + 3.17652I$
$u = -1.253580 + 0.245545I$ $a = 0.451351 - 0.533518I$ $b = -0.095832 - 0.256473I$	$1.87673 + 1.66795I$	0
$u = -1.253580 - 0.245545I$ $a = 0.451351 + 0.533518I$ $b = -0.095832 + 0.256473I$	$1.87673 - 1.66795I$	0
$u = -0.689252 + 0.066561I$ $a = 3.77196 - 0.35800I$ $b = 3.28529 - 0.34701I$	$1.80845 + 2.97035I$	$27.2900 + 10.8535I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.689252 - 0.066561I$ $a = 3.77196 + 0.35800I$ $b = 3.28529 + 0.34701I$	$1.80845 - 2.97035I$	$27.2900 - 10.8535I$
$u = -0.674572$ $a = -3.82901$ $b = -3.39142$	-2.27556	45.0080
$u = -0.649970 + 0.157969I$ $a = 0.715941 + 0.100560I$ $b = 0.728948 - 0.515381I$	$-1.239550 + 0.397962I$	$-8.72729 - 0.25235I$
$u = -0.649970 - 0.157969I$ $a = 0.715941 - 0.100560I$ $b = 0.728948 + 0.515381I$	$-1.239550 - 0.397962I$	$-8.72729 + 0.25235I$
$u = 0.248104 + 0.573900I$ $a = -1.127820 + 0.073338I$ $b = 0.440596 - 0.654495I$	$6.54466 + 1.22183I$	$0.937262 - 0.719785I$
$u = 0.248104 - 0.573900I$ $a = -1.127820 - 0.073338I$ $b = 0.440596 + 0.654495I$	$6.54466 - 1.22183I$	$0.937262 + 0.719785I$
$u = -0.418442 + 0.184487I$ $a = -2.67657 + 0.89298I$ $b = -1.54879 + 0.72191I$	$2.23688 - 2.23181I$	$-2.34161 + 7.40187I$
$u = -0.418442 - 0.184487I$ $a = -2.67657 - 0.89298I$ $b = -1.54879 - 0.72191I$	$2.23688 + 2.23181I$	$-2.34161 - 7.40187I$
$u = 1.54364 + 0.03606I$ $a = 2.07634 + 0.16337I$ $b = 1.72830 + 0.61768I$	$-4.29068 - 2.11335I$	0
$u = 1.54364 - 0.03606I$ $a = 2.07634 - 0.16337I$ $b = 1.72830 - 0.61768I$	$-4.29068 + 2.11335I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.027766+0.439550I$ $a=\ \ 0.616350-1.062520I$ $b=-0.655258+0.345763I$	$0.73320+1.40973I$	$-1.20605-3.84392I$
$u=-0.027766-0.439550I$ $a=\ \ 0.616350+1.062520I$ $b=-0.655258-0.345763I$	$0.73320-1.40973I$	$-1.20605+3.84392I$
$u=-1.60578+0.08607I$ $a=\ \ 1.287790-0.085996I$ $b=\ \ 0.851120-1.100430I$	$-2.34616+6.29316I$	0
$u=-1.60578-0.08607I$ $a=\ \ 1.287790+0.085996I$ $b=\ \ 0.851120+1.100430I$	$-2.34616-6.29316I$	0
$u=\ \ 1.62936+0.03391I$ $a=-1.093500-0.875100I$ $b=-0.96393-1.30038I$	$-9.26887-1.05823I$	0
$u=\ \ 1.62936-0.03391I$ $a=-1.093500+0.875100I$ $b=-0.96393+1.30038I$	$-9.26887+1.05823I$	0
$u=\ \ 1.63403$ $a=\ \ 3.86249$ $b=\ \ 3.49963$	-10.4426	0
$u=\ \ 1.63409+0.02399I$ $a=-3.55343+0.22314I$ $b=-3.14434+0.32055I$	$-6.38831-3.34830I$	0
$u=\ \ 1.63409-0.02399I$ $a=-3.55343-0.22314I$ $b=-3.14434-0.32055I$	$-6.38831+3.34830I$	0
$u=-1.64131+0.04793I$ $a=-1.75205+0.63284I$ $b=-0.658185-0.009831I$	$-7.20909+6.42648I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.64131 - 0.04793I$ $a = -1.75205 - 0.63284I$ $b = -0.658185 + 0.009831I$	$-7.20909 - 6.42648I$	0
$u = -1.65355 + 0.01136I$ $a = 1.75280 - 0.69764I$ $b = 0.698957 + 0.215320I$	$-12.50500 + 1.41291I$	0
$u = -1.65355 - 0.01136I$ $a = 1.75280 + 0.69764I$ $b = 0.698957 - 0.215320I$	$-12.50500 - 1.41291I$	0
$u = -1.65390 + 0.03334I$ $a = -1.55282 - 0.51867I$ $b = -0.800340 + 0.545581I$	$-10.56950 + 4.14320I$	0
$u = -1.65390 - 0.03334I$ $a = -1.55282 + 0.51867I$ $b = -0.800340 - 0.545581I$	$-10.56950 - 4.14320I$	0
$u = -1.67951 + 0.11538I$ $a = -1.84477 - 0.04028I$ $b = -1.28310 + 0.83407I$	$-11.49190 + 6.36006I$	0
$u = -1.67951 - 0.11538I$ $a = -1.84477 + 0.04028I$ $b = -1.28310 - 0.83407I$	$-11.49190 - 6.36006I$	0
$u = 1.67267 + 0.19634I$ $a = -1.242390 + 0.481250I$ $b = -1.087260 - 0.168561I$	$-9.10774 - 7.22720I$	0
$u = 1.67267 - 0.19634I$ $a = -1.242390 - 0.481250I$ $b = -1.087260 + 0.168561I$	$-9.10774 + 7.22720I$	0
$u = -1.67935 + 0.16443I$ $a = -2.00330 + 0.17615I$ $b = -1.48667 + 0.99930I$	$-8.8172 + 15.6243I$	0

Solutions to I^u_1	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.67935-0.16443I$ $a=-2.00330-0.17615I$ $b=-1.48667-0.99930I$	$-8.8172-15.6243I$	0
$u=-1.68414+0.14421I$ $a=\ \ 1.95556-0.07671I$ $b=\ \ 1.41912-0.91577I$	$-13.9245+11.1963I$	0
$u=-1.68414-0.14421I$ $a=\ \ 1.95556+0.07671I$ $b=\ \ 1.41912+0.91577I$	$-13.9245-11.1963I$	0
$u=\ \ 1.69608+0.16003I$ $a=\ \ 1.070460-0.423461I$ $b=\ \ 0.938968+0.203592I$	$-13.44530-3.25448I$	0
$u=\ \ 1.69608-0.16003I$ $a=\ \ 1.070460+0.423461I$ $b=\ \ 0.938968-0.203592I$	$-13.44530+3.25448I$	0
$u=-0.008362+0.294687I$ $a=-2.44024-0.48075I$ $b=-0.419854+1.049640I$	$3.27067+3.66399I$	$-0.860825-0.895430I$
$u=-0.008362-0.294687I$ $a=-2.44024+0.48075I$ $b=-0.419854-1.049640I$	$3.27067-3.66399I$	$-0.860825+0.895430I$
$u=\ \ 1.72348+0.11551I$ $a=-0.803597+0.371179I$ $b=-0.707949-0.235462I$	$-10.04190+0.66192I$	0
$u=\ \ 1.72348-0.11551I$ $a=-0.803597-0.371179I$ $b=-0.707949+0.235462I$	$-10.04190-0.66192I$	0
$u=-0.146978+0.147957I$ $a=\ \ 3.53532-0.76333I$ $b=\ \ 0.722322-0.678600I$	$-1.35611+0.52258I$	$-7.48776+0.18415I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.146978 - 0.147957I$ $a = 3.53532 + 0.76333I$ $b = 0.722322 + 0.678600I$	$-1.35611 - 0.52258I$	$-7.48776 - 0.18415I$

II. $I_2^u = \langle b - a,\ a^3 - a^2 + 1,\ u + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -a^2 + 5a - 11$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = \quad 0.877439 + 0.744862I$ $b = \quad 0.877439 + 0.744862I$	$1.37919 - 2.82812I$	$-6.82789 + 2.41717I$
$u = -1.00000$ $a = \quad 0.877439 - 0.744862I$ $b = \quad 0.877439 - 0.744862I$	$1.37919 + 2.82812I$	$-6.82789 - 2.41717I$
$u = -1.00000$ $a = -0.754878$ $b = -0.754878$	-2.75839	-15.3440

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_{12}	$(u^3 - u^2 + 2u - 1)(u^{71} - 2u^{70} + \cdots - 8u - 1)$
c_2	$u^3(u^{71} - 5u^{70} + \cdots + 12u - 8)$
c_3	$(u^3 - u^2 + 1)(u^{71} + 2u^{70} + \cdots - 14304u - 929)$
c_4	$(u^3 + u^2 + 2u + 1)(u^{71} - 2u^{70} + \cdots - 8u - 1)$
c_5	$((u - 1)^3)(u^{71} - 4u^{70} + \cdots + 3u - 1)$
c_6, c_7	$((u - 1)^3)(u^{71} + 4u^{70} + \cdots - 11u - 1)$
c_8	$(u^3 - u^2 + 1)(u^{71} - 22u^{69} + \cdots - 460924u - 201793)$
c_9	$(u^3 - u^2 + 1)(u^{71} - 2u^{70} + \cdots - 1978u - 169)$
c_{10}, c_{11}	$((u + 1)^3)(u^{71} + 4u^{70} + \cdots - 11u - 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_{12}	$(y^3 + 3y^2 + 2y - 1)(y^{71} + 60y^{70} + \cdots + 40y - 1)$
c_2	$y^3(y^{71} + 21y^{70} + \cdots + 720y - 64)$
c_3	$(y^3 - y^2 + 2y - 1)(y^{71} - 36y^{70} + \cdots + 3.01605 \times 10^7 y - 863041)$
c_5	$((y-1)^3)(y^{71} + 2y^{70} + \cdots - 3y - 1)$
c_6, c_7, c_{10} c_{11}	$((y-1)^3)(y^{71} - 86y^{70} + \cdots - 3y - 1)$
c_8	$(y^3 - y^2 + 2y - 1)$ $\cdot (y^{71} - 44y^{70} + \cdots - 833663350352y - 40720414849)$
c_9	$(y^3 - y^2 + 2y - 1)(y^{71} - 96y^{70} + \cdots + 7503396y - 28561)$