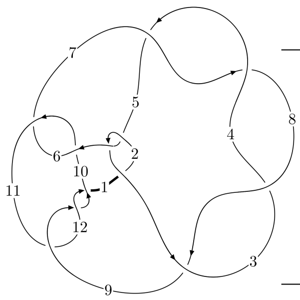
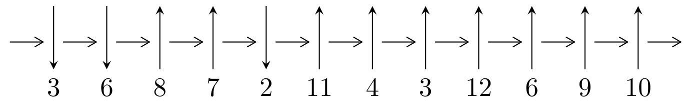
# $12n_{0454}$ ($K12n_{0454}$)




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$\begin{aligned}
I_1^u = \langle & -5.34392 \times 10^{24} u^{30} + 1.20403 \times 10^{25} u^{29} + \cdots + 2.13898 \times 10^{24} b - 8.19442 \times 10^{25}, \\
& -5.24612 \times 10^{24} u^{30} + 1.21449 \times 10^{25} u^{29} + \cdots + 2.13898 \times 10^{24} a - 6.53057 \times 10^{25}, \\
& u^{31} - 2u^{30} + \cdots + 28u + 4 \rangle \\
I_2^u = \langle & 3b - u - 2,\ 3a + 2u + 1,\ u^2 + u + 1 \rangle \\
I_3^u = \langle & au + 3b - 4a + 2u + 1,\ 2a^2 - 3au + 2a + u - 3,\ u^2 + 2 \rangle
\end{aligned}$$

$$I_1^v = \langle a,\ b - v + 2,\ v^2 - 3v + 1 \rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 39 representations.

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[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. $I_1^u = \langle -5.34\times10^{24}u^{30} + 1.20\times10^{25}u^{29} + \cdots + 2.14\times10^{24}b - 8.19\times10^{25},\ -5.25\times10^{24}u^{30} + 1.21\times10^{25}u^{29} + \cdots + 2.14\times10^{24}a - 6.53\times10^{25},\ u^{31} - 2u^{30} + \cdots + 28u + 4\rangle$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}2.45262u^{30} - 5.67789u^{29} + \cdots + 112.994u + 30.5312\\2.49834u^{30} - 5.62900u^{29} + \cdots + 123.421u + 38.3098\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}2.40875u^{30} - 5.56826u^{29} + \cdots + 108.882u + 29.9698\\2.45447u^{30} - 5.51937u^{29} + \cdots + 119.309u + 37.7485\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u\\u^3 + u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u^2 + 1\\-u^4 - 2u^2\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0.185869u^{30} - 0.506326u^{29} + \cdots + 8.73363u - 0.480369\\0.954311u^{30} - 2.13631u^{29} + \cdots + 45.6943u + 14.8328\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1.20265u^{30} - 2.80559u^{29} + \cdots + 57.4529u + 14.8908\\-1.14984u^{30} + 2.60951u^{29} + \cdots - 55.1167u - 16.9723\end{pmatrix}$$
$$a_1 = \begin{pmatrix}0.0528171u^{30} - 0.196085u^{29} + \cdots + 2.33621u - 2.08152\\-1.14984u^{30} + 2.60951u^{29} + \cdots - 55.1167u - 16.9723\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-0.871927u^{30} + 2.04345u^{29} + \cdots - 48.9524u - 11.3712\\2.44025u^{30} - 5.52900u^{29} + \cdots + 118.778u + 35.8466\end{pmatrix}$$

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes** $= \frac{4015001484774077203470484 6}{1604238713781269697683811}u^{30} - \frac{30333063294678849729282082}{5347462379270898992279 37}u^{29} + \cdots + \frac{64274400679188810551014457 0}{5347462379270898992279 37}u + \frac{61684632229249657415380258 0}{1604238713781269697683811}$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{31} + 34u^{30} + \cdots + 16249u + 361$ |
| $c_2, c_5$ | $u^{31} + 4u^{30} + \cdots - 17u + 19$ |
| $c_3, c_4, c_7$<br>$c_8$ | $u^{31} + 2u^{30} + \cdots + 28u - 4$ |
| $c_6, c_{10}$ | $u^{31} + 2u^{30} + \cdots - 36u - 36$ |
| $c_9, c_{11}, c_{12}$ | $u^{31} + 6u^{30} + \cdots + 5u + 9$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{31} - 74y^{30} + \cdots + 131918441y - 130321$ |
| $c_2, c_5$ | $y^{31} - 34y^{30} + \cdots + 16249y - 361$ |
| $c_3, c_4, c_7$ $c_8$ | $y^{31} + 40y^{30} + \cdots + 272y - 16$ |
| $c_6, c_{10}$ | $y^{31} + 6y^{30} + \cdots + 2232y - 1296$ |
| $c_9, c_{11}, c_{12}$ | $y^{31} - 20y^{30} + \cdots + 223y - 81$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.150087+0.994909I$<br>$a = 0.49984-1.89088I$<br>$b = 1.130920-0.806791I$ | $-3.71035-1.41787I$ | $3.38804+1.32048I$ |
| $u = -0.150087-0.994909I$<br>$a = 0.49984+1.89088I$<br>$b = 1.130920+0.806791I$ | $-3.71035+1.41787I$ | $3.38804-1.32048I$ |
| $u = 0.949025+0.259341I$<br>$a = -0.072682+0.704869I$<br>$b = 0.582494-0.117627I$ | $-3.71574-2.40842I$ | $3.33618+2.66984I$ |
| $u = 0.949025-0.259341I$<br>$a = -0.072682-0.704869I$<br>$b = 0.582494+0.117627I$ | $-3.71574+2.40842I$ | $3.33618-2.66984I$ |
| $u = -0.761649+0.761026I$<br>$a = -0.101228+0.295647I$<br>$b = -0.778145-0.069572I$ | $1.17088-2.70519I$ | $1.34730+7.26275I$ |
| $u = -0.761649-0.761026I$<br>$a = -0.101228-0.295647I$<br>$b = -0.778145+0.069572I$ | $1.17088+2.70519I$ | $1.34730-7.26275I$ |
| $u = 0.801880+0.845490I$<br>$a = 0.192710+0.190905I$<br>$b = 1.308920-0.176651I$ | $-5.44830+8.20678I$ | $3.96431-6.25123I$ |
| $u = 0.801880-0.845490I$<br>$a = 0.192710-0.190905I$<br>$b = 1.308920+0.176651I$ | $-5.44830-8.20678I$ | $3.96431+6.25123I$ |
| $u = 0.518296+1.138380I$<br>$a = 0.075776+0.484959I$<br>$b = -0.478186-0.043766I$ | $-8.10871+2.46499I$ | $0$ |
| $u = 0.518296-1.138380I$<br>$a = 0.075776-0.484959I$<br>$b = -0.478186+0.043766I$ | $-8.10871-2.46499I$ | $0$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.239573+1.258650I$<br>$a=-0.049051+0.239996I$<br>$b=-0.174354-0.870729I$ | $3.35227-2.03069I$ | $6.00000+0.I$ |
| $u=-0.239573-1.258650I$<br>$a=-0.049051-0.239996I$<br>$b=-0.174354+0.870729I$ | $3.35227+2.03069I$ | $6.00000+0.I$ |
| $u=-0.049257+0.651330I$<br>$a=0.031163+0.438228I$<br>$b=0.636530+0.528351I$ | $-1.02719-1.35876I$ | $0.38562+5.54408I$ |
| $u=-0.049257-0.651330I$<br>$a=0.031163-0.438228I$<br>$b=0.636530-0.528351I$ | $-1.02719+1.35876I$ | $0.38562-5.54408I$ |
| $u=-0.01769+1.49068I$<br>$a=-1.84020+1.15884I$<br>$b=-2.05375+1.80415I$ | $-4.97013+0.88940I$ | 0 |
| $u=-0.01769-1.49068I$<br>$a=-1.84020-1.15884I$<br>$b=-2.05375-1.80415I$ | $-4.97013-0.88940I$ | 0 |
| $u=0.146387+0.409089I$<br>$a=0.10548-1.80116I$<br>$b=-1.016560+0.397771I$ | $1.43804+0.67860I$ | $5.66172+1.82882I$ |
| $u=0.146387-0.409089I$<br>$a=0.10548+1.80116I$<br>$b=-1.016560-0.397771I$ | $1.43804-0.67860I$ | $5.66172-1.82882I$ |
| $u=-0.333653$<br>$a=4.41543$<br>$b=-0.313107$ | 7.50433 | 24.5590 |
| $u=0.06381+1.68753I$<br>$a=1.345990+0.237815I$<br>$b=1.82999-0.04669I$ | $-9.31296-0.73241I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.06381 - 1.68753I$<br>$a = 1.345990 - 0.237815I$<br>$b = 1.82999 + 0.04669I$ | $-9.31296 + 0.73241I$ | 0 |
| $u = 0.26352 + 1.68744I$<br>$a = 1.67424 + 0.15516I$<br>$b = 2.20381 - 0.62844I$ | $-13.9459 + 12.3803I$ | 0 |
| $u = 0.26352 - 1.68744I$<br>$a = 1.67424 - 0.15516I$<br>$b = 2.20381 + 0.62844I$ | $-13.9459 - 12.3803I$ | 0 |
| $u = -0.18187 + 1.70595I$<br>$a = -1.372120 - 0.010334I$<br>$b = -1.81881 - 0.60789I$ | $-7.53329 - 6.21670I$ | 0 |
| $u = -0.18187 - 1.70595I$<br>$a = -1.372120 + 0.010334I$<br>$b = -1.81881 + 0.60789I$ | $-7.53329 + 6.21670I$ | 0 |
| $u = -0.283237$<br>$a = -1.71193$<br>$b = -0.227764$ | 0.766548 | 14.0280 |
| $u = -0.03812 + 1.72844I$<br>$a = 1.237920 - 0.134015I$<br>$b = 1.67073 + 0.76279I$ | $-13.51010 - 2.18010I$ | 0 |
| $u = -0.03812 - 1.72844I$<br>$a = 1.237920 + 0.134015I$<br>$b = 1.67073 - 0.76279I$ | $-13.51010 + 2.18010I$ | 0 |
| $u = -0.260390$<br>$a = -0.560132$<br>$b = 2.58879$ | $-0.450742$ | 39.0360 |
| $u = 0.13397 + 1.76472I$<br>$a = -1.46619 - 0.05769I$<br>$b = -2.23420 - 0.13354I$ | $-18.3679 + 5.2164I$ | 0 |

| Solutions to $I^u_1$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \quad 0.13397 - 1.76472I$<br>$a = -1.46619 + 0.05769I$<br>$b = -2.23420 + 0.13354I$ | $-18.3679 - 5.2164I$ | 0 |

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

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ u+1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -\frac{2}{3}u - \frac{1}{3} \\ \frac{1}{3}u + \frac{2}{3} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{5}{3}u - \frac{1}{3} \\ -\frac{2}{3}u + \frac{2}{3} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u+1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ u+2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ u+1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -\frac{2}{3}u - \frac{1}{3} \\ \frac{1}{3}u + \frac{2}{3} \end{pmatrix}$$

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= \frac{4}{3}u + 7$

**(iv) u-Polynomials at the component**

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

**(v) Riley Polynomials at the component**

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

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.500000 + 0.866025I$<br>$a = \quad - 0.577350I$<br>$b = 0.500000 + 0.288675I$ | $1.64493 - 2.02988I$ | $6.33333 + 1.15470I$ |
| $u = -0.500000 - 0.866025I$<br>$a = \quad 0.577350I$<br>$b = 0.500000 - 0.288675I$ | $1.64493 + 2.02988I$ | $6.33333 - 1.15470I$ |

**III.** $I_3^u = \langle au + 3b - 4a + 2u + 1,\ 2a^2 - 3au + 2a + u - 3,\ u^2 + 2\rangle$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} a \\ -\frac{1}{3}au + \frac{4}{3}a - \frac{2}{3}u - \frac{1}{3} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} \frac{2}{3}au + \frac{1}{3}a + \frac{4}{3}u + \frac{2}{3} \\ \frac{1}{3}au + \frac{2}{3}a + \frac{2}{3}u + \frac{1}{3} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{3}au + \frac{1}{3}a - \frac{7}{6}u - \frac{4}{3} \\ -1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{3}au + \frac{1}{3}a - \frac{7}{6}u - \frac{1}{3} \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{3}au + \frac{1}{3}a - \frac{7}{6}u - \frac{4}{3} \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -au + a - \frac{3}{2}u - 2 \\ -\frac{2}{3}au + \frac{2}{3}a - \frac{1}{3}u - \frac{5}{3} \end{pmatrix}$$

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= 4$

**(iv) u-Polynomials at the component**

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

**(v) Riley Polynomials at the component**

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

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_3^u$ | $\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.414210I$<br>$a = 0.618034 + 0.270091I$<br>$b = 0.618034 - 0.874032I$ | 2.30291 | 4.00000 |
| $u = 1.414210I$<br>$a = -1.61803 + 1.85123I$<br>$b = -1.61803 + 2.28825I$ | −5.59278 | 4.00000 |
| $u = -1.414210I$<br>$a = 0.618034 - 0.270091I$<br>$b = 0.618034 + 0.874032I$ | 2.30291 | 4.00000 |
| $u = -1.414210I$<br>$a = -1.61803 - 1.85123I$<br>$b = -1.61803 - 2.28825I$ | −5.59278 | 4.00000 |

## IV. $I_1^v = \langle a,\ b - v + 2,\ v^2 - 3v + 1\rangle$

**(i) Arc colorings**

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

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= -6$

**(iv) u-Polynomials at the component**

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

**(v) Riley Polynomials at the component**

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

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^v$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $v = 0.381966$<br>$a = 0$<br>$b = -1.61803$ | $-0.657974$ | $-6.00000$ |
| $v = 2.61803$<br>$a = 0$<br>$b = 0.618034$ | $7.23771$ | $-6.00000$ |

**V. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $((u-1)^6)(u^2+u+1)(u^{31}+34u^{30}+\cdots+16249u+361)$ |
| $c_2$ | $((u-1)^2)(u+1)^4(u^2-u+1)(u^{31}+4u^{30}+\cdots-17u+19)$ |
| $c_3, c_4$ | $u^2(u^2+2)^2(u^2+u+1)(u^{31}+2u^{30}+\cdots+28u-4)$ |
| $c_5$ | $((u-1)^4)(u+1)^2(u^2+u+1)(u^{31}+4u^{30}+\cdots-17u+19)$ |
| $c_6$ | $u^2(u^2-u-1)(u^2+u-1)^2(u^{31}+2u^{30}+\cdots-36u-36)$ |
| $c_7, c_8$ | $u^2(u^2+2)^2(u^2-u+1)(u^{31}+2u^{30}+\cdots+28u-4)$ |
| $c_9$ | $((u+1)^2)(u^2-u-1)^3(u^{31}+6u^{30}+\cdots+5u+9)$ |
| $c_{10}$ | $u^2(u^2-u-1)^2(u^2+u-1)(u^{31}+2u^{30}+\cdots-36u-36)$ |
| $c_{11}, c_{12}$ | $((u-1)^2)(u^2+u-1)^3(u^{31}+6u^{30}+\cdots+5u+9)$ |

## VI. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $((y-1)^6)(y^2+y+1)(y^{31}-74y^{30}+\cdots+1.31918\times 10^8 y-130321)$ |
| $c_2, c_5$ | $((y-1)^6)(y^2+y+1)(y^{31}-34y^{30}+\cdots+16249y-361)$ |
| $c_3, c_4, c_7$<br>$c_8$ | $y^2(y+2)^4(y^2+y+1)(y^{31}+40y^{30}+\cdots+272y-16)$ |
| $c_6, c_{10}$ | $y^2(y^2-3y+1)^3(y^{31}+6y^{30}+\cdots+2232y-1296)$ |
| $c_9, c_{11}, c_{12}$ | $((y-1)^2)(y^2-3y+1)^3(y^{31}-20y^{30}+\cdots+223y-81)$ |