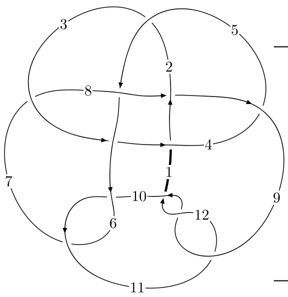
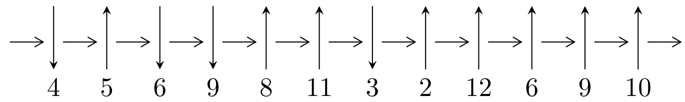
# $12n_{0665}$ ($K12n_{0665}$)




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$\begin{aligned}
I_1^u = \langle & 1.16371 \times 10^{21} u^{21} - 5.81881 \times 10^{21} u^{20} + \cdots + 1.46625 \times 10^{23} b - 4.63210 \times 10^{22}, \\
& 2.23290 \times 10^{22} u^{21} - 1.79700 \times 10^{23} u^{20} + \cdots + 1.17300 \times 10^{24} a - 8.46516 \times 10^{23},\ u^{22} - 7u^{21} + \cdots - u - 16\rangle \\
I_2^u = \langle & -12a^3 + 35a^2 + 361b + 258a + 225,\ 4a^4 + 7a^3 + 20a^2 + 5a + 11,\ u + 1\rangle \\
I_3^u = \langle & -u^8 + 4u^7 - 6u^6 + 2u^5 + 5u^4 - 6u^3 + 4u^2 + b - 3u,\ u^8 - 3u^7 + 2u^6 + 4u^5 - 7u^4 + u^3 + u^2 + a + u + 2, \\
& u^{11} - 4u^{10} + 5u^9 + 2u^8 - 11u^7 + 8u^6 - u^4 + 4u^3 - 5u^2 + u - 1\rangle \\
I_4^u = \langle & -1309u^{10} a + 39316u^{10} + \cdots - 49959a - 27286,\ -16711u^{10} a + 2773u^{10} + \cdots - 53855a - 50795, \\
& u^{11} - 5u^{10} + 12u^9 - 14u^8 + 4u^7 + 11u^6 - 16u^5 + 14u^4 - 8u^3 - 13u^2 + 7u - 1\rangle \\
I_5^u = \langle & -2a^5 - 176a^4 - 669a^3 + 284a^2 + 13805b + 9351a + 7409,\ a^6 + 6a^5 + 21a^4 + 39a^3 + 66a^2 + 49a + 59, \\
& u + 1\rangle \\
I_6^u = \langle & au + b - a - 2u + 3,\ a^2 + 4au - 3a - 3u + 6,\ u^2 - u - 1\rangle
\end{aligned}$$

* 6 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 69 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.**

$\boldsymbol{I_1^u = \langle 1.16\times10^{21}u^{21} - 5.82\times10^{21}u^{20} + \cdots + 1.47\times10^{23}b - 4.63\times10^{22},\ 2.23\times10^{22}u^{21} - 1.80\times10^{23}u^{20} + \cdots + 1.17\times10^{24}a - 8.47\times10^{23},\ u^{22} - 7u^{21} + \cdots - u - 16\rangle}$

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.0190358u^{21} + 0.153197u^{20} + \cdots + 2.30959u + 0.721667 \\ -0.00793664u^{21} + 0.0396850u^{20} + \cdots + 0.0736575u + 0.315914 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.0269724u^{21} + 0.192882u^{20} + \cdots + 2.38324u + 1.03758 \\ -0.00793664u^{21} + 0.0396850u^{20} + \cdots + 0.0736575u + 0.315914 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.00755456u^{21} + 0.0556100u^{20} + \cdots + 2.97731u + 1.14656 \\ 0.0129445u^{21} - 0.0689040u^{20} + \cdots + 0.462289u + 0.147994 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.0468616u^{21} - 0.281682u^{20} + \cdots + 0.728053u + 0.542790 \\ -0.0303212u^{21} + 0.179358u^{20} + \cdots - 0.268846u - 0.786470 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.0501899u^{21} + 0.326221u^{20} + \cdots + 0.776174u - 0.236818 \\ 0.0251088u^{21} - 0.165046u^{20} + \cdots + 0.287008u + 0.803039 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -0.0503171u^{21} + 0.321861u^{20} + \cdots + 0.00116367u - 0.311783 \\ 0.0264975u^{21} - 0.160879u^{20} + \cdots + 1.44637u + 0.689429 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.0529780u^{21} - 0.337734u^{20} + \cdots - 0.360484u + 0.467102 \\ -0.0278969u^{21} + 0.176559u^{20} + \cdots - 0.702698u - 1.03332 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= \frac{1046540992390926455030041}{4692001596758932331121536}u^{21} - \frac{692312832330241174483901}{586500199594866541390192}u^{20} + \cdots + \frac{2199600109368455878617314 3}{4692001596758932331121536}u + \frac{1233054846153246715242967}{293250099797433270695096}$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $u^{22} - 22u^{20} + \cdots - 78u + 1$ |
| $c_2$ | $u^{22} + 17u^{21} + \cdots + 72u + 4$ |
| $c_4, c_7$ | $u^{22} - 10u^{20} + \cdots - 82u + 17$ |
| $c_5, c_8$ | $u^{22} + u^{21} + \cdots - u + 1$ |
| $c_6, c_{10}$ | $u^{22} + 5u^{21} + \cdots + 224u - 256$ |
| $c_9, c_{11}, c_{12}$ | $u^{22} + 7u^{21} + \cdots + u - 16$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $y^{22} - 44y^{21} + \cdots - 6066y + 1$ |
| $c_2$ | $y^{22} - y^{21} + \cdots - 984y + 16$ |
| $c_4, c_7$ | $y^{22} - 20y^{21} + \cdots - 4038y + 289$ |
| $c_5, c_8$ | $y^{22} + 9y^{21} + \cdots + 9y + 1$ |
| $c_6, c_{10}$ | $y^{22} + 27y^{21} + \cdots - 291840y + 65536$ |
| $c_9, c_{11}, c_{12}$ | $y^{22} - 5y^{21} + \cdots - y + 256$ |

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

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -1.073320 + 0.196864I$<br>$a = -0.633075 + 1.048060I$<br>$b = -0.468525 - 0.581818I$ | $0.748660 - 0.578139I$ | $4.16300 - 3.21064I$ |
| $u = -1.073320 - 0.196864I$<br>$a = -0.633075 - 1.048060I$<br>$b = -0.468525 + 0.581818I$ | $0.748660 + 0.578139I$ | $4.16300 + 3.21064I$ |
| $u = 1.196940 + 0.138834I$<br>$a = 0.69651 - 1.48448I$<br>$b = -0.525572 + 0.904919I$ | $4.76890 + 7.93706I$ | $14.4936 - 13.4042I$ |
| $u = 1.196940 - 0.138834I$<br>$a = 0.69651 + 1.48448I$<br>$b = -0.525572 - 0.904919I$ | $4.76890 - 7.93706I$ | $14.4936 + 13.4042I$ |
| $u = -1.281740 + 0.445541I$<br>$a = -1.340360 - 0.152402I$<br>$b = 1.042560 - 0.544528I$ | $0.63415 - 1.82383I$ | $3.25206 + 1.96969I$ |
| $u = -1.281740 - 0.445541I$<br>$a = -1.340360 + 0.152402I$<br>$b = 1.042560 + 0.544528I$ | $0.63415 + 1.82383I$ | $3.25206 - 1.96969I$ |
| $u = 1.41326$<br>$a = 1.00267$<br>$b = -0.555579$ | 7.32600 | 23.7620 |
| $u = -0.583556$<br>$a = -0.207344$<br>$b = -0.336659$ | 0.970302 | 10.0070 |
| $u = -0.37029 + 1.42559I$<br>$a = 0.958773 + 0.111950I$<br>$b = -1.88452 + 0.10002I$ | $-3.47219 - 4.63898I$ | $1.76510 + 3.68966I$ |
| $u = -0.37029 - 1.42559I$<br>$a = 0.958773 - 0.111950I$<br>$b = -1.88452 - 0.10002I$ | $-3.47219 + 4.63898I$ | $1.76510 - 3.68966I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.305160 + 0.425228I$<br>$a = 0.75251 + 1.97105I$<br>$b = 0.656252 - 0.746018I$ | $-0.88734 + 1.99220I$ | $-1.51650 - 2.98007I$ |
| $u = 0.305160 - 0.425228I$<br>$a = 0.75251 - 1.97105I$<br>$b = 0.656252 + 0.746018I$ | $-0.88734 - 1.99220I$ | $-1.51650 + 2.98007I$ |
| $u = 1.01095 + 1.14167I$<br>$a = 0.424540 - 0.460153I$<br>$b = -1.387840 + 0.091887I$ | $-9.81793 + 5.07725I$ | $-1.39233 - 9.54863I$ |
| $u = 1.01095 - 1.14167I$<br>$a = 0.424540 + 0.460153I$<br>$b = -1.387840 - 0.091887I$ | $-9.81793 - 5.07725I$ | $-1.39233 + 9.54863I$ |
| $u = 1.16674 + 1.00051I$<br>$a = 0.282150 - 1.116250I$<br>$b = -1.143540 + 0.418541I$ | $-9.23521 + 2.88093I$ | $1.62002 + 2.72235I$ |
| $u = 1.16674 - 1.00051I$<br>$a = 0.282150 + 1.116250I$<br>$b = -1.143540 - 0.418541I$ | $-9.23521 - 2.88093I$ | $1.62002 - 2.72235I$ |
| $u = -0.238163 + 0.343586I$<br>$a = 0.92161 + 1.69413I$<br>$b = 0.423005 + 0.405652I$ | $-1.61974 - 1.37202I$ | $-2.26771 + 5.71937I$ |
| $u = -0.238163 - 0.343586I$<br>$a = 0.92161 - 1.69413I$<br>$b = 0.423005 - 0.405652I$ | $-1.61974 + 1.37202I$ | $-2.26771 - 5.71937I$ |
| $u = 1.44040 + 1.00087I$<br>$a = -0.54794 + 2.42657I$<br>$b = 1.53075 - 1.61655I$ | $-10.9142 + 15.8777I$ | $4.46326 - 7.01203I$ |
| $u = 1.44040 - 1.00087I$<br>$a = -0.54794 - 2.42657I$<br>$b = 1.53075 + 1.61655I$ | $-10.9142 - 15.8777I$ | $4.46326 + 7.01203I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.92846 + 1.61543I$<br>$a = -1.69364 - 0.69437I$<br>$b = 2.20355 + 1.18551I$ | $-13.0092 - 6.5361I$ | $2.81617 + 3.19876I$ |
| $u = 0.92846 - 1.61543I$<br>$a = -1.69364 + 0.69437I$<br>$b = 2.20355 - 1.18551I$ | $-13.0092 + 6.5361I$ | $2.81617 - 3.19876I$ |

**II.**

$$\boldsymbol{I_2^u = \langle -12a^3 + 35a^2 + 361b + 258a + 225,\ 4a^4 + 7a^3 + 20a^2 + 5a + 11,\ u + 1\rangle}$$

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} a \\ 0.0332410a^3 - 0.0969529a^2 - 0.714681a - 0.623269 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.0332410a^3 - 0.0969529a^2 + 0.285319a - 0.623269 \\ 0.0332410a^3 - 0.0969529a^2 - 0.714681a - 0.623269 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.0332410a^3 + 0.0969529a^2 - 0.285319a - 1.37673 \\ -0.188366a^3 - 0.783934a^2 - 0.950139a - 0.468144 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.443213a^3 + 1.37396a^2 + 1.47091a + 1.68975 \\ -0.221607a^3 - 0.686981a^2 - 0.235457a - 0.844875 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.387812a^3 + 0.202216a^2 + 0.662050a + 0.728532 \\ -0.387812a^3 - 0.202216a^2 - 0.662050a - 0.728532 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.288089a^3 + 0.493075a^2 - 0.193906a - 0.401662 \\ -0.221607a^3 - 0.686981a^2 - 0.235457a - 0.844875 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.387812a^3 + 0.202216a^2 + 0.662050a + 0.728532 \\ -0.387812a^3 - 0.202216a^2 - 0.662050a - 0.728532 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= \frac{640}{361}a^3 + \frac{1623}{361}a^2 + \frac{2846}{361}a + \frac{2079}{361}$

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

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

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

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

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

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -1.00000$<br>$a = -0.017843 + 0.799588I$<br>$b = -0.547424 - 0.585652I$ | $0.66484 - 1.39709I$ | $2.80605 + 5.27044I$ |
| $u = -1.00000$<br>$a = -0.017843 - 0.799588I$<br>$b = -0.547424 + 0.585652I$ | $0.66484 + 1.39709I$ | $2.80605 - 5.27044I$ |
| $u = -1.00000$<br>$a = -0.85716 + 1.88797I$<br>$b = \quad 0.547424 - 1.120870I$ | $4.26996 + 7.64338I$ | $1.41270 - 4.22005I$ |
| $u = -1.00000$<br>$a = -0.85716 - 1.88797I$<br>$b = \quad 0.547424 + 1.120870I$ | $4.26996 - 7.64338I$ | $1.41270 + 4.22005I$ |

**III.**

$\boldsymbol{I^u_3 = \langle -u^8+4u^7+\cdots+b-3u,\ u^8-3u^7+\cdots+a+2,\ u^{11}-4u^{10}+\cdots+u-1\rangle}$

**(i) Arc colorings**

$$a_9 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$

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

$$a_1 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$

$$a_5 = \begin{pmatrix}-u^8+3u^7-2u^6-4u^5+7u^4-u^3-u^2-u-2\\u^8-4u^7+6u^6-2u^5-5u^4+6u^3-4u^2+3u\end{pmatrix}$$

$$a_4 = \begin{pmatrix}-u^7+4u^6-6u^5+2u^4+5u^3-5u^2+2u-2\\u^8-4u^7+6u^6-2u^5-5u^4+6u^3-4u^2+3u\end{pmatrix}$$

$$a_2 = \begin{pmatrix}-2u^{10}+10u^9+\cdots-3u+2\\u^8-4u^7+6u^6-2u^5-5u^4+5u^3-3u^2+3u-1\end{pmatrix}$$

$$a_8 = \begin{pmatrix}-u^{10}+6u^9+\cdots-3u+3\\u^{10}-5u^9+9u^8-4u^7-8u^6+10u^5-2u^4+3u^3-3u^2-2u-1\end{pmatrix}$$

$$a_6 = \begin{pmatrix}u^{10}-4u^9+4u^8+5u^7-14u^6+6u^5+6u^4-4u^3+4u^2-4u\\u^9-3u^8+3u^7+2u^6-6u^5+3u^4-u^2+u-1\end{pmatrix}$$

$$a_3 = \begin{pmatrix}-u^7+4u^6-6u^5+2u^4+5u^3-4u^2+2u-3\\u^8-4u^7+6u^6-2u^5-5u^4+5u^3-4u^2+4u\end{pmatrix}$$

$$a_7 = \begin{pmatrix}u^{10}-3u^9+u^8+8u^7-13u^6+3u^5+6u^4-6u^3+7u^2-4u+1\\u^6-3u^5+3u^4+2u^3-4u^2+u-2\end{pmatrix}$$

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

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

**(iii) Cusp Shapes**
$= -6u^{10}+27u^9-43u^8+8u^7+58u^6-59u^5+6u^4+4u^3-6u^2+18u+1$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $u^{11} - 6u^{10} + \cdots + u - 1$ |
| $c_2$ | $u^{11} + 5u^{10} + \cdots + 66u + 11$ |
| $c_4, c_7$ | $u^{11} - 3u^9 - 3u^8 + 3u^7 + 5u^6 + u^5 - 2u^4 + u^3 + 4u^2 + 3u + 1$ |
| $c_5, c_8$ | $u^{11} + 3u^{10} + 4u^9 + u^8 - 2u^7 + u^6 + 5u^5 + 3u^4 - 3u^3 - 3u^2 + 1$ |
| $c_6$ | $u^{11} + 2u^{10} + 5u^9 + 3u^8 - 6u^7 - 12u^6 - 4u^5 - u^4 - 4u^3 - 5u^2 - u - 1$ |
| $c_9$ | $u^{11} - 4u^{10} + 5u^9 + 2u^8 - 11u^7 + 8u^6 - u^4 + 4u^3 - 5u^2 + u - 1$ |
| $c_{10}$ | $u^{11} - 2u^{10} + 5u^9 - 3u^8 - 6u^7 + 12u^6 - 4u^5 + u^4 - 4u^3 + 5u^2 - u + 1$ |
| $c_{11}, c_{12}$ | $u^{11} + 4u^{10} + 5u^9 - 2u^8 - 11u^7 - 8u^6 + u^4 + 4u^3 + 5u^2 + u + 1$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $y^{11} - 6y^{10} + \cdots - 11y - 1$ |
| $c_2$ | $y^{11} - 5y^{10} + \cdots + 1056y - 121$ |
| $c_4, c_7$ | $y^{11} - 6y^{10} + \cdots + y - 1$ |
| $c_5, c_8$ | $y^{11} - y^{10} + \cdots + 6y - 1$ |
| $c_6, c_{10}$ | $y^{11} + 6y^{10} + \cdots - 9y - 1$ |
| $c_9, c_{11}, c_{12}$ | $y^{11} - 6y^{10} + \cdots - 9y - 1$ |

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

| Solutions to $I_3^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -1.086170 + 0.009391I$<br>$a = 4.41295 + 0.00742I$<br>$b = -0.701762 - 0.657333I$ | $2.65196 - 3.67431I$ | $-5.84307 + 3.56499I$ |
| $u = -1.086170 - 0.009391I$<br>$a = 4.41295 - 0.00742I$<br>$b = -0.701762 + 0.657333I$ | $2.65196 + 3.67431I$ | $-5.84307 - 3.56499I$ |
| $u = -0.107619 + 0.709932I$<br>$a = 0.895151 + 0.275061I$<br>$b = 0.954711 - 0.673787I$ | $0.30466 + 2.75309I$ | $5.01781 - 3.90984I$ |
| $u = -0.107619 - 0.709932I$<br>$a = 0.895151 - 0.275061I$<br>$b = 0.954711 + 0.673787I$ | $0.30466 - 2.75309I$ | $5.01781 + 3.90984I$ |
| $u = 1.298730 + 0.273936I$<br>$a = -0.597874 + 1.164320I$<br>$b = 0.400683 - 0.540159I$ | $4.37786 + 7.33604I$ | $4.82590 - 2.92832I$ |
| $u = 1.298730 - 0.273936I$<br>$a = -0.597874 - 1.164320I$<br>$b = 0.400683 + 0.540159I$ | $4.37786 - 7.33604I$ | $4.82590 + 2.92832I$ |
| $u = 1.47992$<br>$a = -1.10702$<br>$b = 0.798074$ | $6.99554$ | $-1.23750$ |
| $u = 0.031910 + 0.483612I$<br>$a = -1.42549 - 0.63001I$<br>$b = 0.551419 + 0.729779I$ | $0.36189 - 4.26572I$ | $1.88771 + 6.83487I$ |
| $u = 0.031910 - 0.483612I$<br>$a = -1.42549 + 0.63001I$<br>$b = 0.551419 - 0.729779I$ | $0.36189 + 4.26572I$ | $1.88771 - 6.83487I$ |
| $u = 1.12319 + 1.19275I$<br>$a = 0.768773 - 0.735083I$<br>$b = -1.60409 + 0.22290I$ | $-9.54921 + 4.30931I$ | $3.23041 - 0.76635I$ |

| Solutions to $I_3^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.12319 - 1.19275I$ | | |
| $a = 0.768773 + 0.735083I$ | $-9.54921 - 4.30931I$ | $3.23041 + 0.76635I$ |
| $b = -1.60409 - 0.22290I$ | | |

**IV.** $\boldsymbol{I^u_4 = \langle -1309u^{10}a + 39316u^{10} + \cdots - 49959a - 27286,\ -16711u^{10}a + 2773u^{10} + \cdots - 53855a - 50795,\ u^{11} - 5u^{10} + \cdots + 7u - 1\rangle}$

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} a \\ 0.00589438au^{10} - 0.177038u^{10} + \cdots + 0.224964a + 0.122868 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.00589438au^{10} - 0.177038u^{10} + \cdots + 1.22496a + 0.122868 \\ 0.00589438au^{10} - 0.177038u^{10} + \cdots + 0.224964a + 0.122868 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.773073au^{10} + 0.470695u^{10} + \cdots - 3.09852a - 1.05429 \\ 0.224964au^{10} - 0.715602u^{10} + \cdots + 0.773073a - 1.44519 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.119743au^{10} - 1.31813u^{10} + \cdots + 0.473820a - 2.23776 \\ -0.143618au^{10} + 0.302113u^{10} + \cdots - 0.296781a + 0.607909 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1.65276u^{10} - 7.83688u^9 + \cdots - 24.1541u + 5.81695 \\ -0.426939u^{10} + 2.03454u^9 + \cdots + 5.75239u - 1.65276 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.360480au^{10} + 0.470695u^{10} + \cdots - 0.370306a - 1.05429 \\ 0.140546au^{10} - 0.617437u^{10} + \cdots + 0.591338a - 0.524865 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1.71387u^{10} + 8.17163u^9 + \cdots + 25.2157u - 6.14373 \\ 0.488045u^{10} - 2.36929u^9 + \cdots - 6.81403u + 1.97954 \end{pmatrix}$$

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

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

**(iii) Cusp Shapes** $= -\frac{1665}{1882}u^{10} + \frac{7853}{1882}u^9 - \frac{15635}{1882}u^8 + \frac{9431}{1882}u^7 + \frac{19187}{1882}u^6 - \frac{21601}{941}u^5 + \frac{38751}{1882}u^4 - \frac{9650}{941}u^3 + \frac{7699}{1882}u^2 + \frac{38133}{1882}u - \frac{2836}{941}$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $u^{22} + 4u^{21} + \cdots + 3144u - 1751$ |
| $c_2$ | $(u^{11} - 2u^{10} + 4u^9 - 4u^8 + 7u^7 - 6u^6 + 8u^5 - 3u^4 + 7u^3 - 5u^2 + 6u + 4)^2$ |
| $c_4, c_7$ | $u^{22} - u^{21} + \cdots - 1853u - 367$ |
| $c_5, c_8$ | $u^{22} + 3u^{21} + \cdots + 43u + 17$ |
| $c_6, c_{10}$ | $(u^{11} - 2u^{10} + \cdots + 20u + 8)^2$ |
| $c_9, c_{11}, c_{12}$ | $(u^{11} + 5u^{10} + \cdots + 7u + 1)^2$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $y^{22} - 34y^{21} + \cdots + 14797360y + 3066001$ |
| $c_2$ | $(y^{11} + 4y^{10} + \cdots + 76y - 16)^2$ |
| $c_4, c_7$ | $y^{22} - 21y^{21} + \cdots - 11844515y + 134689$ |
| $c_5, c_8$ | $y^{22} - 5y^{21} + \cdots + 157y + 289$ |
| $c_6, c_{10}$ | $(y^{11} + 18y^{10} + \cdots - 48y - 64)^2$ |
| $c_9, c_{11}, c_{12}$ | $(y^{11} - y^{10} + \cdots + 23y - 1)^2$ |

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

| Solutions to $I_4^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.079725 + 1.068410I$<br>$a = 0.856962 + 0.168668I$<br>$b = -2.18146 - 0.23527I$ | $-1.62432 + 3.00088I$ | $0.33499 - 3.49194I$ |
| $u = -0.079725 + 1.068410I$<br>$a = 0.439244 + 1.098550I$<br>$b = 0.798257 - 1.114970I$ | $-1.62432 + 3.00088I$ | $0.33499 - 3.49194I$ |
| $u = -0.079725 - 1.068410I$<br>$a = 0.856962 - 0.168668I$<br>$b = -2.18146 + 0.23527I$ | $-1.62432 - 3.00088I$ | $0.33499 + 3.49194I$ |
| $u = -0.079725 - 1.068410I$<br>$a = 0.439244 - 1.098550I$<br>$b = 0.798257 + 1.114970I$ | $-1.62432 - 3.00088I$ | $0.33499 + 3.49194I$ |
| $u = -0.884145 + 0.095736I$<br>$a = -1.16290 - 2.05270I$<br>$b = -0.559456 + 0.879724I$ | $2.07033 + 3.52584I$ | $11.0814 - 10.6105I$ |
| $u = -0.884145 + 0.095736I$<br>$a = -0.69396 - 4.81962I$<br>$b = 0.969577 - 0.463172I$ | $2.07033 + 3.52584I$ | $11.0814 - 10.6105I$ |
| $u = -0.884145 - 0.095736I$<br>$a = -1.16290 + 2.05270I$<br>$b = -0.559456 - 0.879724I$ | $2.07033 - 3.52584I$ | $11.0814 + 10.6105I$ |
| $u = -0.884145 - 0.095736I$<br>$a = -0.69396 + 4.81962I$<br>$b = 0.969577 + 0.463172I$ | $2.07033 - 3.52584I$ | $11.0814 + 10.6105I$ |
| $u = 1.53174$<br>$a = 0.113755$<br>$b = 0.109337$ | 7.41447 | 30.3990 |
| $u = 1.53174$<br>$a = 2.58390$<br>$b = -1.70388$ | 7.41447 | 30.3990 |

| Solutions to $I_4^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.238296 + 0.095870I$<br>$a = 2.84346 - 2.84451I$<br>$b = -0.419609 + 0.270447I$ | $0.52440 - 2.64086I$ | $1.94796 + 2.03870I$ |
| $u = 0.238296 + 0.095870I$<br>$a = -2.77344 - 3.23631I$<br>$b = 0.478533 + 1.099150I$ | $0.52440 - 2.64086I$ | $1.94796 + 2.03870I$ |
| $u = 0.238296 - 0.095870I$<br>$a = 2.84346 + 2.84451I$<br>$b = -0.419609 - 0.270447I$ | $0.52440 + 2.64086I$ | $1.94796 - 2.03870I$ |
| $u = 0.238296 - 0.095870I$<br>$a = -2.77344 + 3.23631I$<br>$b = 0.478533 - 1.099150I$ | $0.52440 + 2.64086I$ | $1.94796 - 2.03870I$ |
| $u = 1.45203 + 1.04949I$<br>$a = 0.660877 - 1.207490I$<br>$b = -1.32301 + 0.63561I$ | $-9.67193 + 7.23582I$ | $3.59903 - 5.42641I$ |
| $u = 1.45203 + 1.04949I$<br>$a = -0.68206 + 2.97589I$<br>$b = 1.68145 - 2.15398I$ | $-9.67193 + 7.23582I$ | $3.59903 - 5.42641I$ |
| $u = 1.45203 - 1.04949I$<br>$a = 0.660877 + 1.207490I$<br>$b = -1.32301 - 0.63561I$ | $-9.67193 - 7.23582I$ | $3.59903 + 5.42641I$ |
| $u = 1.45203 - 1.04949I$<br>$a = -0.68206 - 2.97589I$<br>$b = 1.68145 + 2.15398I$ | $-9.67193 - 7.23582I$ | $3.59903 + 5.42641I$ |
| $u = 1.00768 + 1.54288I$<br>$a = 0.930928 - 0.584899I$<br>$b = -1.71241 + 0.28243I$ | $-11.45500 + 2.23657I$ | $0.837127 - 0.170303I$ |
| $u = 1.00768 + 1.54288I$<br>$a = -2.26794 - 1.18182I$<br>$b = 2.56540 + 1.84699I$ | $-11.45500 + 2.23657I$ | $0.837127 - 0.170303I$ |

| Solutions to $I_4^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.00768 - 1.54288I$<br>$a = 0.930928 + 0.584899I$<br>$b = -1.71241 - 0.28243I$ | $-11.45500 - 2.23657I$ | $0.837127 + 0.170303I$ |
| $u = 1.00768 - 1.54288I$<br>$a = -2.26794 + 1.18182I$<br>$b = 2.56540 - 1.84699I$ | $-11.45500 - 2.23657I$ | $0.837127 + 0.170303I$ |

**V. $I_5^u = \langle -2a^5 + 13805b + \cdots + 9351a + 7409,\ a^6 + 6a^5 + 21a^4 + 39a^3 + 66a^2 + 49a + 59,\ u + 1\rangle$**

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} a \\ 0.000144875a^5 + 0.0127490a^4 + \cdots - 0.677363a - 0.536690 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.000144875a^5 + 0.0127490a^4 + \cdots + 0.322637a - 0.536690 \\ 0.000144875a^5 + 0.0127490a^4 + \cdots - 0.677363a - 0.536690 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.000144875a^5 - 0.0127490a^4 + \cdots - 0.322637a - 1.46331 \\ 0.0117349a^5 + 0.0326693a^4 + \cdots - 0.866425a - 0.471858 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.0231800a^5 - 0.0398406a^4 + \cdots + 1.37812a + 1.87034 \\ 0.0594712a^5 + 0.233466a^4 + \cdots - 0.557624a - 1.81108 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.0488953a^5 - 0.302789a^4 + \cdots - 0.889895a - 1.36726 \\ 0.0488953a^5 + 0.302789a^4 + \cdots + 0.889895a + 1.36726 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -0.0591815a^5 - 0.207968a^4 + \cdots + 0.202898a + 0.737704 \\ 0.0594712a^5 + 0.233466a^4 + \cdots - 0.557624a - 1.81108 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.0488953a^5 - 0.302789a^4 + \cdots - 0.889895a - 1.36726 \\ 0.0488953a^5 + 0.302789a^4 + \cdots + 0.889895a + 1.36726 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -\frac{32}{2761}a^5 - \frac{5}{251}a^4 + \frac{340}{2761}a^3 + \frac{1783}{2761}a^2 + \frac{3283}{2761}a + \frac{24670}{2761}$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_3, c_4$ | $u^6 + u^5 + 2u^4 + 2u^3 + 2u^2 + 2u + 1$ |
| $c_2$ | $(u^3 + u^2 - 1)^2$ |
| $c_5$ | $u^6 + 3u^5 + 4u^4 + 2u^3 + 1$ |
| $c_6, c_{10}$ | $u^6$ |
| $c_7$ | $u^6 - u^5 + 2u^4 - 2u^3 + 2u^2 - 2u + 1$ |
| $c_8$ | $u^6 - 3u^5 + 4u^4 - 2u^3 + 1$ |
| $c_9$ | $(u + 1)^6$ |
| $c_{11}, c_{12}$ | $(u - 1)^6$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3, c_4$ $c_7$ | $y^6 + 3y^5 + 4y^4 + 2y^3 + 1$ |
| $c_2$ | $(y^3 - y^2 + 2y - 1)^2$ |
| $c_5, c_8$ | $y^6 - y^5 + 4y^4 - 2y^3 + 8y^2 + 1$ |
| $c_6, c_{10}$ | $y^6$ |
| $c_9, c_{11}, c_{12}$ | $(y-1)^6$ |

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

| Solutions to $I_5^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.00000$<br>$a=\ \ 0.037526+1.309480I$<br>$b=-0.498832-1.001300I$ | $1.91067-2.82812I$ | $7.78492+1.30714I$ |
| $u=-1.00000$<br>$a=\ \ 0.037526-1.309480I$<br>$b=-0.498832+1.001300I$ | $1.91067+2.82812I$ | $7.78492-1.30714I$ |
| $u=-1.00000$<br>$a=-0.69240+1.75059I$<br>$b=\ \ 0.284920-1.115140I$ | $6.04826$ | $7.43016+0.I$ |
| $u=-1.00000$<br>$a=-0.69240-1.75059I$<br>$b=\ \ 0.284920+1.115140I$ | $6.04826$ | $7.43016+0.I$ |
| $u=-1.00000$<br>$a=-2.34512+2.04966I$<br>$b=\ \ 0.713912-0.305839I$ | $1.91067-2.82812I$ | $7.78492+1.30714I$ |
| $u=-1.00000$<br>$a=-2.34512-2.04966I$<br>$b=\ \ 0.713912+0.305839I$ | $1.91067+2.82812I$ | $7.78492-1.30714I$ |

**VI.** $I_6^u = \langle au + b - a - 2u + 3,\ a^2 + 4au - 3a - 3u + 6,\ u^2 - u - 1\rangle$

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ -u-1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ -u-1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} a \\ -au+a+2u-3 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -au+2a+2u-3 \\ -au+a+2u-3 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -au+2a+3u-3 \\ -au+a+u-4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -2au+2a+3u-8 \\ au+2u+2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ u+1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -au+2a+3u-3 \\ -au+a+u-4 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -9u - 1$

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

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

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

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

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

| Solutions to $I_6^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.618034$<br>$a = 2.73607 + 0.60666I$<br>$b = 0.190983 + 0.981593I$ | $-0.657974$ | $4.56230$ |
| $u = -0.618034$<br>$a = 2.73607 - 0.60666I$<br>$b = 0.190983 - 0.981593I$ | $-0.657974$ | $4.56230$ |
| $u = 1.61803$<br>$a = -0.369308$<br>$b = 0.464313$ | $7.23771$ | $-15.5620$ |
| $u = 1.61803$<br>$a = -3.10283$<br>$b = 2.15372$ | $7.23771$ | $-15.5620$ |

## VII. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $(u-1)^4(u^4+u^2-u+1)(u^6+u^5+2u^4+2u^3+2u^2+2u+1)$<br>$\cdot(u^{11}-6u^{10}+\cdots+u-1)(u^{22}-22u^{20}+\cdots-78u+1)$<br>$\cdot(u^{22}+4u^{21}+\cdots+3144u-1751)$ |
| $c_2$ | $u^4(u^3+u^2-1)^2(u^4-3u^3+4u^2-3u+2)$<br>$\cdot(u^{11}-2u^{10}+4u^9-4u^8+7u^7-6u^6+8u^5-3u^4+7u^3-5u^2+6u+4)^2$<br>$\cdot(u^{11}+5u^{10}+\cdots+66u+11)(u^{22}+17u^{21}+\cdots+72u+4)$ |
| $c_4$ | $(u^4+u^2-u+1)(u^4+3u^3+3u^2+3u+1)$<br>$\cdot(u^6+u^5+2u^4+2u^3+2u^2+2u+1)$<br>$\cdot(u^{11}-3u^9-3u^8+3u^7+5u^6+u^5-2u^4+u^3+4u^2+3u+1)$<br>$\cdot(u^{22}-10u^{20}+\cdots-82u+17)(u^{22}-u^{21}+\cdots-1853u-367)$ |
| $c_5$ | $(u^4+2u^3+3u^2+u+1)(u^4+3u^3+3u^2+3u+1)$<br>$\cdot(u^6+3u^5+4u^4+2u^3+1)$<br>$\cdot(u^{11}+3u^{10}+4u^9+u^8-2u^7+u^6+5u^5+3u^4-3u^3-3u^2+1)$<br>$\cdot(u^{22}+u^{21}+\cdots-u+1)(u^{22}+3u^{21}+\cdots+43u+17)$ |
| $c_6$ | $u^{10}(u^2-u-1)^2(u^{11}-2u^{10}+\cdots+20u+8)^2$<br>$\cdot(u^{11}+2u^{10}+5u^9+3u^8-6u^7-12u^6-4u^5-u^4-4u^3-5u^2-u-1)$<br>$\cdot(u^{22}+5u^{21}+\cdots+224u-256)$ |
| $c_7$ | $(u^4+u^2+u+1)(u^4+3u^3+3u^2+3u+1)$<br>$\cdot(u^6-u^5+2u^4-2u^3+2u^2-2u+1)$<br>$\cdot(u^{11}-3u^9-3u^8+3u^7+5u^6+u^5-2u^4+u^3+4u^2+3u+1)$<br>$\cdot(u^{22}-10u^{20}+\cdots-82u+17)(u^{22}-u^{21}+\cdots-1853u-367)$ |
| $c_8$ | $(u^4-2u^3+3u^2-u+1)(u^4+3u^3+3u^2+3u+1)$<br>$\cdot(u^6-3u^5+4u^4-2u^3+1)$<br>$\cdot(u^{11}+3u^{10}+4u^9+u^8-2u^7+u^6+5u^5+3u^4-3u^3-3u^2+1)$<br>$\cdot(u^{22}+u^{21}+\cdots-u+1)(u^{22}+3u^{21}+\cdots+43u+17)$ |
| $c_9$ | $(u+1)^{10}(u^2-u-1)^2$<br>$\cdot(u^{11}-4u^{10}+5u^9+2u^8-11u^7+8u^6-u^4+4u^3-5u^2+u-1)$<br>$\cdot((u^{11}+5u^{10}+\cdots+7u+1)^2)(u^{22}+7u^{21}+\cdots+u-16)$ |
| $c_{10}$ | $u^{10}(u^2+u-1)^2$<br>$\cdot(u^{11}-2u^{10}+5u^9-3u^8-6u^7+12u^6-4u^5+u^4-4u^3+5u^2-u+1)$<br>$\cdot((u^{11}-2u^{10}+\cdots+20u+8)^2)(u^{22}+5u^{21}+\cdots+224u-256)$ |
| $c_{11}, c_{12}$ | $(u-1)^{10}(u^2+u-1)^2$<br>$\cdot(u^{11}+4u^{10}+5u^9-2u^8-11u^7-8u^6+u^4+4u^3+5u^2+u+1)$<br>$\cdot((u^{11}+5u^{10}+\cdots+7u+1)^2)(u^{22}+7u^{21}+\cdots+u-16)$ |

## VIII. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3$ | $(y-1)^4(y^4+2y^3+3y^2+y+1)(y^6+3y^5+4y^4+2y^3+1)$ $\cdot(y^{11}-6y^{10}+\cdots-11y-1)(y^{22}-44y^{21}+\cdots-6066y+1)$ $\cdot(y^{22}-34y^{21}+\cdots+14797360y+3066001)$ |
| $c_2$ | $y^4(y^3-y^2+2y-1)^2(y^4-y^3+2y^2+7y+4)$ $\cdot(y^{11}-5y^{10}+\cdots+1056y-121)(y^{11}+4y^{10}+\cdots+76y-16)^2$ $\cdot(y^{22}-y^{21}+\cdots-984y+16)$ |
| $c_4, c_7$ | $(y^4-3y^3-7y^2-3y+1)(y^4+2y^3+3y^2+y+1)$ $\cdot(y^6+3y^5+4y^4+2y^3+1)(y^{11}-6y^{10}+\cdots+y-1)$ $\cdot(y^{22}-21y^{21}+\cdots-11844515y+134689)$ $\cdot(y^{22}-20y^{21}+\cdots-4038y+289)$ |
| $c_5, c_8$ | $(y^4-3y^3-7y^2-3y+1)(y^4+2y^3+7y^2+5y+1)$ $\cdot(y^6-y^5+4y^4-2y^3+8y^2+1)(y^{11}-y^{10}+\cdots+6y-1)$ $\cdot(y^{22}-5y^{21}+\cdots+157y+289)(y^{22}+9y^{21}+\cdots+9y+1)$ |
| $c_6, c_{10}$ | $y^{10}(y^2-3y+1)^2(y^{11}+6y^{10}+\cdots-9y-1)$ $\cdot(y^{11}+18y^{10}+\cdots-48y-64)^2$ $\cdot(y^{22}+27y^{21}+\cdots-291840y+65536)$ |
| $c_9, c_{11}, c_{12}$ | $((y-1)^{10})(y^2-3y+1)^2(y^{11}-6y^{10}+\cdots-9y-1)$ $\cdot((y^{11}-y^{10}+\cdots+23y-1)^2)(y^{22}-5y^{21}+\cdots-y+256)$ |