# $12a_{0486}$ $(K12a_{0486})$



A knot diagram[1]

**Linearized knot diagam**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ | $\to$ |
| | 3 | 6 | 11 | 12 | 7 | 2 | 1 | 4 | 5 | 8 | 9 | 10 |

**Solving Sequence**

$$3,6 \xrightarrow{c_2} 2 \xrightarrow{c_6} 7 \xrightarrow{c_1} 1 \xrightarrow{c_7} 8 \xrightarrow{c_5} 5,10 \xrightarrow{c_9} 9 \xrightarrow{c_{12}} 12 \xrightarrow{c_4} 4 \xrightarrow{c_{11}} 11 \twoheadrightarrow c_3, c_8, c_{10}$$
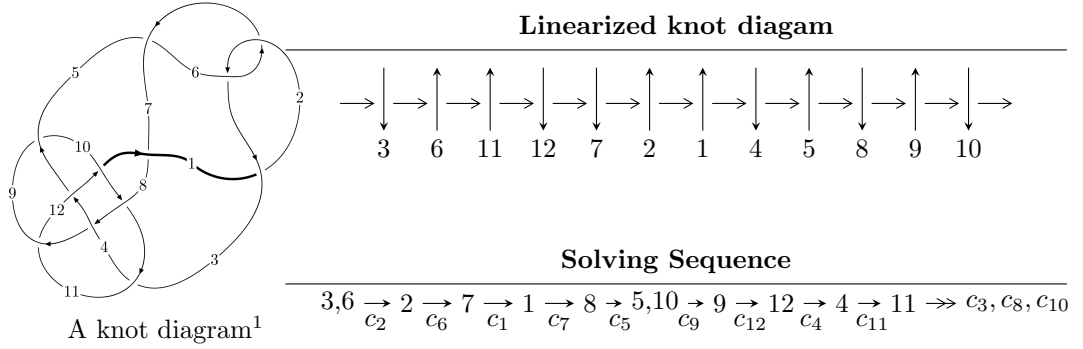
**Ideals for irreducible components[2]of $X_{\mathbf{par}}$**

$I_1^u = \langle -48599558u^{68} - 169298104u^{67} + \cdots + 17100943b - 315531735,$
$\qquad 350511433u^{68} + 1020261118u^{67} + \cdots + 119706601a - 2664075662,\ u^{69} + 5u^{68} + \cdots - 11u + 7 \rangle$

$I_2^u = \langle -352821u^{46}a - 5119679u^{46} + \cdots - 1763091a + 4390751,\ -u^{46}a - 4u^{46} + \cdots + 4a - 2,$
$\qquad u^{47} - 2u^{46} + \cdots - 2u + 1 \rangle$

$I_3^u = \langle u^{22} + u^{21} + \cdots + b + 3u,\ u^{23} - 2u^{22} + \cdots + a + 3,\ u^{24} - 2u^{23} + \cdots + 7u^2 + 1 \rangle$

$I_4^u = \langle au + b + u + 1,\ a^2 - 3au - 3u - 2,\ u^2 + u + 1 \rangle$

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

\* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 192 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.**

$$I_1^u = \langle -4.86 \times 10^7 u^{68} - 1.69 \times 10^8 u^{67} + \cdots + 1.71 \times 10^7 b - 3.16 \times 10^8, \ 3.51 \times 10^8 u^{68} + 1.02 \times 10^9 u^{67} + \cdots + 1.20 \times 10^8 a - 2.66 \times 10^9, \ u^{69} + 5u^{68} + \cdots - 11u + 7 \rangle$$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} u^7 + 2u^5 + 2u^3 + 2u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -2.92809u^{68} - 8.52301u^{67} + \cdots - 75.4142u + 22.2550 \\ 2.84192u^{68} + 9.89993u^{67} + \cdots - 49.7328u + 18.4511 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -4.76650u^{68} - 13.2256u^{67} + \cdots - 105.769u + 29.5256 \\ -1.57547u^{68} - 5.78395u^{67} + \cdots - 56.6428u + 13.2040 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -4.76183u^{68} - 9.61536u^{67} + \cdots - 111.548u + 35.3483 \\ -3.57547u^{68} - 12.7839u^{67} + \cdots - 42.6428u + 6.20396 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -2.98023u^{68} - 12.1415u^{67} + \cdots + 22.7597u - 10.5704 \\ -2.77581u^{68} - 13.7928u^{67} + \cdots + 33.0385u - 16.8236 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 8.01122u^{68} + 28.2908u^{67} + \cdots + 64.2914u - 4.00348 \\ 2.70124u^{68} + 10.8019u^{67} + \cdots - 12.4433u + 9.09453 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -\frac{53809100}{17100943}u^{68} - \frac{239622692}{17100943}u^{67} + \cdots + \frac{686921128}{17100943}u - \frac{253153132}{17100943}$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{69} + 23u^{68} + \cdots + 65u - 49$ |
| $c_2, c_6$ | $u^{69} - 5u^{68} + \cdots - 11u - 7$ |
| $c_3, c_9$ | $u^{69} - 2u^{68} + \cdots - 3u - 1$ |
| $c_4, c_8$ | $u^{69} - u^{68} + \cdots - 2u - 1$ |
| $c_7$ | $u^{69} + 25u^{68} + \cdots - 59915u - 3703$ |
| $c_{10}, c_{12}$ | $u^{69} + 10u^{68} + \cdots + 29u - 1$ |
| $c_{11}$ | $u^{69} + 38u^{68} + \cdots - 64u - 7$ |

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

| Crossings | Riley Polynomials at each crossing |
|-----------|-----------------------------------|
| $c_1, c_5$ | $y^{69} + 51y^{68} + \cdots + 29901y - 2401$ |
| $c_2, c_6$ | $y^{69} + 23y^{68} + \cdots + 65y - 49$ |
| $c_3, c_9$ | $y^{69} - 6y^{68} + \cdots - 33y - 1$ |
| $c_4, c_8$ | $y^{69} - 29y^{68} + \cdots + 76y - 1$ |
| $c_7$ | $y^{69} + 3y^{68} + \cdots - 816311009y - 13712209$ |
| $c_{10}, c_{12}$ | $y^{69} - 42y^{68} + \cdots + 27y - 1$ |
| $c_{11}$ | $y^{69} + 50y^{67} + \cdots + 134y - 49$ |

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## (vi) Complex Volumes and Cusp Shapes

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.012222 + 1.002130I$ <br> $a = -1.121370 + 0.553514I$ <br> $b = 1.66113 + 0.68765I$ | $-5.00379 - 0.12361I$ | $-9.98584 + 0.I$ |
| $u = -0.012222 - 1.002130I$ <br> $a = -1.121370 - 0.553514I$ <br> $b = 1.66113 - 0.68765I$ | $-5.00379 + 0.12361I$ | $-9.98584 + 0.I$ |
| $u = 0.716065 + 0.706433I$ <br> $a = -1.78731 - 1.65142I$ <br> $b = -0.623796 - 0.900743I$ | $0.0540759 - 0.0939258I$ | $0$ |
| $u = 0.716065 - 0.706433I$ <br> $a = -1.78731 + 1.65142I$ <br> $b = -0.623796 + 0.900743I$ | $0.0540759 + 0.0939258I$ | $0$ |
| $u = -0.683285 + 0.702977I$ <br> $a = -1.68834 - 0.68669I$ <br> $b = -1.82191 + 0.42380I$ | $-0.234320 - 0.001152I$ | $-2.25563 + 0.I$ |
| $u = -0.683285 - 0.702977I$ <br> $a = -1.68834 + 0.68669I$ <br> $b = -1.82191 - 0.42380I$ | $-0.234320 + 0.001152I$ | $-2.25563 + 0.I$ |
| $u = -0.793801 + 0.571976I$ <br> $a = 1.148810 + 0.200493I$ <br> $b = 0.957086 - 0.158430I$ | $-0.92159 - 2.20912I$ | $-4.61148 + 3.51139I$ |
| $u = -0.793801 - 0.571976I$ <br> $a = 1.148810 - 0.200493I$ <br> $b = 0.957086 + 0.158430I$ | $-0.92159 + 2.20912I$ | $-4.61148 - 3.51139I$ |
| $u = 0.141687 + 1.029870I$ <br> $a = -0.843291 - 0.549722I$ <br> $b = 1.237290 + 0.564726I$ | $-5.58220 + 1.94498I$ | $-10.57738 + 0.I$ |
| $u = 0.141687 - 1.029870I$ <br> $a = -0.843291 + 0.549722I$ <br> $b = 1.237290 - 0.564726I$ | $-5.58220 - 1.94498I$ | $-10.57738 + 0.I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.796333 + 0.677780I$ <br> $a = -2.41597 + 0.72004I$ <br> $b = -2.10792 + 1.43766I$ | $0.15968 + 5.61109I$ | $0$ |
| $u = -0.796333 - 0.677780I$ <br> $a = -2.41597 - 0.72004I$ <br> $b = -2.10792 - 1.43766I$ | $0.15968 - 5.61109I$ | $0$ |
| $u = \phantom{-}0.110513 + 1.048830I$ <br> $a = -1.236350 + 0.224439I$ <br> $b = \phantom{-}2.06677 - 0.35387I$ | $-6.03215 + 5.53076I$ | $0$ |
| $u = \phantom{-}0.110513 - 1.048830I$ <br> $a = -1.236350 - 0.224439I$ <br> $b = \phantom{-}2.06677 + 0.35387I$ | $-6.03215 - 5.53076I$ | $0$ |
| $u = -0.119600 + 0.926304I$ <br> $a = \phantom{-}0.219849 - 0.770724I$ <br> $b = -0.850774 - 0.031966I$ | $-1.43506 - 1.95242I$ | $-2.33460 + 4.04464I$ |
| $u = -0.119600 - 0.926304I$ <br> $a = \phantom{-}0.219849 + 0.770724I$ <br> $b = -0.850774 + 0.031966I$ | $-1.43506 + 1.95242I$ | $-2.33460 - 4.04464I$ |
| $u = -0.837875 + 0.662257I$ <br> $a = \phantom{-}2.29743 - 0.93819I$ <br> $b = \phantom{-}1.91355 - 1.36492I$ | $1.6483 + 14.5043I$ | $0$ |
| $u = -0.837875 - 0.662257I$ <br> $a = \phantom{-}2.29743 + 0.93819I$ <br> $b = \phantom{-}1.91355 + 1.36492I$ | $1.6483 - 14.5043I$ | $0$ |
| $u = \phantom{-}0.777141 + 0.736280I$ <br> $a = \phantom{-}1.149780 + 0.578014I$ <br> $b = \phantom{-}0.491520 + 0.431357I$ | $4.40070 - 1.06842I$ | $0$ |
| $u = \phantom{-}0.777141 - 0.736280I$ <br> $a = \phantom{-}1.149780 - 0.578014I$ <br> $b = \phantom{-}0.491520 - 0.431357I$ | $4.40070 + 1.06842I$ | $0$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.541394 + 0.923763I$ | | |
| $a = -1.36122 - 1.59201I$ | $-3.42369 + 3.69120I$ | 0 |
| $b = \phantom{-}0.267146 - 0.903066I$ | | |
| $u = \phantom{-}0.541394 - 0.923763I$ | | |
| $a = -1.36122 + 1.59201I$ | $-3.42369 - 3.69120I$ | 0 |
| $b = \phantom{-}0.267146 + 0.903066I$ | | |
| $u = -0.819723 + 0.709991I$ | | |
| $a = -1.252450 - 0.288105I$ | $0.87380 + 1.64675I$ | 0 |
| $b = -1.385820 - 0.016383I$ | | |
| $u = -0.819723 - 0.709991I$ | | |
| $a = -1.252450 + 0.288105I$ | $0.87380 - 1.64675I$ | 0 |
| $b = -1.385820 + 0.016383I$ | | |
| $u = \phantom{-}0.554061 + 0.946702I$ | | |
| $a = \phantom{-}0.09644 - 2.39009I$ | $-3.54428 + 0.34170I$ | 0 |
| $b = \phantom{-}1.003420 - 0.616051I$ | | |
| $u = \phantom{-}0.554061 - 0.946702I$ | | |
| $a = \phantom{-}0.09644 + 2.39009I$ | $-3.54428 - 0.34170I$ | 0 |
| $b = \phantom{-}1.003420 + 0.616051I$ | | |
| $u = -0.745478 + 0.805661I$ | | |
| $a = \phantom{-}0.757979 - 0.428250I$ | $2.31641 - 3.75915I$ | 0 |
| $b = \phantom{-}0.54619 - 1.38301I$ | | |
| $u = -0.745478 - 0.805661I$ | | |
| $a = \phantom{-}0.757979 + 0.428250I$ | $2.31641 + 3.75915I$ | 0 |
| $b = \phantom{-}0.54619 + 1.38301I$ | | |
| $u = \phantom{-}0.139797 + 1.097740I$ | | |
| $a = \phantom{-}0.958448 + 0.089891I$ | $-5.0428 + 14.1417I$ | 0 |
| $b = -2.02653 + 0.54635I$ | | |
| $u = \phantom{-}0.139797 - 1.097740I$ | | |
| $a = \phantom{-}0.958448 - 0.089891I$ | $-5.0428 - 14.1417I$ | 0 |
| $b = -2.02653 - 0.54635I$ | | |

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.063890 + 1.113210I$ | | |
| $a = \phantom{-}0.404800 + 0.058459I$ | $-6.98700 - 3.23243I$ | $0$ |
| $b = -1.167720 - 0.501445I$ | | |
| $u = \phantom{-}0.063890 - 1.113210I$ | | |
| $a = \phantom{-}0.404800 - 0.058459I$ | $-6.98700 + 3.23243I$ | $0$ |
| $b = -1.167720 + 0.501445I$ | | |
| $u = -0.448141 + 0.761288I$ | | |
| $a = \phantom{-}0.546214 - 0.397562I$ | $0.01707 - 1.74830I$ | $-0.18091 + 2.95800I$ |
| $b = -0.055472 - 0.575637I$ | | |
| $u = -0.448141 - 0.761288I$ | | |
| $a = \phantom{-}0.546214 + 0.397562I$ | $0.01707 + 1.74830I$ | $-0.18091 - 2.95800I$ |
| $b = -0.055472 + 0.575637I$ | | |
| $u = \phantom{-}0.485720 + 1.018670I$ | | |
| $a = -0.29913 + 1.96319I$ | $-2.96219 - 7.43047I$ | $0$ |
| $b = -1.205210 + 0.213225I$ | | |
| $u = \phantom{-}0.485720 - 1.018670I$ | | |
| $a = -0.29913 - 1.96319I$ | $-2.96219 + 7.43047I$ | $0$ |
| $b = -1.205210 - 0.213225I$ | | |
| $u = -0.712951 + 0.920207I$ | | |
| $a = \phantom{-}0.724780 - 1.103170I$ | $1.96162 - 1.78958I$ | $0$ |
| $b = -0.89412 - 1.16084I$ | | |
| $u = -0.712951 - 0.920207I$ | | |
| $a = \phantom{-}0.724780 + 1.103170I$ | $1.96162 + 1.78958I$ | $0$ |
| $b = -0.89412 + 1.16084I$ | | |
| $u = -0.666247 + 0.975151I$ | | |
| $a = \phantom{-}0.87734 + 2.02741I$ | $-1.05699 - 5.23860I$ | $0$ |
| $b = \phantom{-}2.22184 + 0.18370I$ | | |
| $u = -0.666247 - 0.975151I$ | | |
| $a = \phantom{-}0.87734 - 2.02741I$ | $-1.05699 + 5.23860I$ | $0$ |
| $b = \phantom{-}2.22184 - 0.18370I$ | | |

| | Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|---|
| $u =$ | $0.729961 + 0.368810I$ | | |
| $a =$ | $0.653129 + 1.020220I$ | $-1.97006 - 5.23474I$ | $-2.27710 + 5.73809I$ |
| $b =$ | $0.569812 + 0.486825I$ | | |
| $u =$ | $0.729961 - 0.368810I$ | | |
| $a =$ | $0.653129 - 1.020220I$ | $-1.97006 + 5.23474I$ | $-2.27710 - 5.73809I$ |
| $b =$ | $0.569812 - 0.486825I$ | | |
| $u =$ | $0.568755 + 1.036610I$ | | |
| $a =$ | $0.83010 + 1.37787I$ | $-3.88153 + 10.01270I$ | $0$ |
| $b =$ | $-0.441338 + 0.942217I$ | | |
| $u =$ | $0.568755 - 1.036610I$ | | |
| $a =$ | $0.83010 - 1.37787I$ | $-3.88153 - 10.01270I$ | $0$ |
| $b =$ | $-0.441338 - 0.942217I$ | | |
| $u =$ | $-0.812502 + 0.862501I$ | | |
| $a =$ | $0.154560 - 0.114706I$ | $5.21176 - 10.95100I$ | $0$ |
| $b =$ | $-0.133160 + 0.560845I$ | | |
| $u =$ | $-0.812502 - 0.862501I$ | | |
| $a =$ | $0.154560 + 0.114706I$ | $5.21176 + 10.95100I$ | $0$ |
| $b =$ | $-0.133160 - 0.560845I$ | | |
| $u =$ | $0.680791 + 0.980389I$ | | |
| $a =$ | $-0.27668 - 2.49060I$ | $-0.77573 + 5.46732I$ | $0$ |
| $b =$ | $0.83048 - 1.24615I$ | | |
| $u =$ | $0.680791 - 0.980389I$ | | |
| $a =$ | $-0.27668 + 2.49060I$ | $-0.77573 - 5.46732I$ | $0$ |
| $b =$ | $0.83048 + 1.24615I$ | | |
| $u =$ | $-0.802033 + 0.901610I$ | | |
| $a =$ | $-0.511400 - 0.076132I$ | $5.09360 + 4.92645I$ | $0$ |
| $b =$ | $0.268850 + 0.356050I$ | | |
| $u =$ | $-0.802033 - 0.901610I$ | | |
| $a =$ | $-0.511400 + 0.076132I$ | $5.09360 - 4.92645I$ | $0$ |
| $b =$ | $0.268850 - 0.356050I$ | | |

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.719215 + 0.976978I$ | | |
| $a = -0.303296 + 1.329610I$ | $3.66707 + 6.73077I$ | $0$ |
| $b = -0.628169 + 0.547859I$ | | |
| $u = \phantom{-}0.719215 - 0.976978I$ | | |
| $a = -0.303296 - 1.329610I$ | $3.66707 - 6.73077I$ | $0$ |
| $b = -0.628169 - 0.547859I$ | | |
| $u = -0.710906 + 1.012370I$ | | |
| $a = \phantom{-}0.02535 + 3.15247I$ | $-0.85162 - 11.29640I$ | $0$ |
| $b = \phantom{-}2.49262 + 1.37298I$ | | |
| $u = -0.710906 - 1.012370I$ | | |
| $a = \phantom{-}0.02535 - 3.15247I$ | $-0.85162 + 11.29640I$ | $0$ |
| $b = \phantom{-}2.49262 - 1.37298I$ | | |
| $u = -0.673456 + 1.039560I$ | | |
| $a = -0.467776 - 1.318920I$ | $-2.30054 - 3.29537I$ | $0$ |
| $b = -1.306860 - 0.312183I$ | | |
| $u = -0.673456 - 1.039560I$ | | |
| $a = -0.467776 + 1.318920I$ | $-2.30054 + 3.29537I$ | $0$ |
| $b = -1.306860 + 0.312183I$ | | |
| $u = -0.731358 + 1.008530I$ | | |
| $a = \phantom{-}0.90677 + 1.57723I$ | $-0.04166 - 7.47084I$ | $0$ |
| $b = \phantom{-}1.55923 - 0.04851I$ | | |
| $u = -0.731358 - 1.008530I$ | | |
| $a = \phantom{-}0.90677 - 1.57723I$ | $-0.04166 + 7.47084I$ | $0$ |
| $b = \phantom{-}1.55923 + 0.04851I$ | | |
| $u = \phantom{-}0.703757 + 0.228722I$ | | |
| $a = \phantom{-}1.70911 - 0.02367I$ | $-0.65978 + 11.64210I$ | $1.56318 - 8.06482I$ |
| $b = \phantom{-}1.263340 - 0.518926I$ | | |
| $u = \phantom{-}0.703757 - 0.228722I$ | | |
| $a = \phantom{-}1.70911 + 0.02367I$ | $-0.65978 - 11.64210I$ | $1.56318 + 8.06482I$ |
| $b = \phantom{-}1.263340 + 0.518926I$ | | |

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.722375 + 1.033830I$ | | |
| $a = \phantom{-}0.02797 - 2.99925I$ | $0.5162 - 20.3389I$ | $0$ |
| $b = -2.20797 - 1.41096I$ | | |
| $u = -0.722375 - 1.033830I$ | | |
| $a = \phantom{-}0.02797 + 2.99925I$ | $0.5162 + 20.3389I$ | $0$ |
| $b = -2.20797 + 1.41096I$ | | |
| $u = \phantom{-}0.868018 + 0.916637I$ | | |
| $a = \phantom{-}0.153455 + 0.272902I$ | $7.87304 + 3.21385I$ | $0$ |
| $b = \phantom{-}0.021429 + 0.199037I$ | | |
| $u = \phantom{-}0.868018 - 0.916637I$ | | |
| $a = \phantom{-}0.153455 - 0.272902I$ | $7.87304 - 3.21385I$ | $0$ |
| $b = \phantom{-}0.021429 - 0.199037I$ | | |
| $u = \phantom{-}0.560624 + 0.241305I$ | | |
| $a = -1.43460 - 0.41224I$ | $-1.98795 + 3.58898I$ | $-4.22570 - 7.51690I$ |
| $b = -1.009480 + 0.562273I$ | | |
| $u = \phantom{-}0.560624 - 0.241305I$ | | |
| $a = -1.43460 + 0.41224I$ | $-1.98795 - 3.58898I$ | $-4.22570 + 7.51690I$ |
| $b = -1.009480 - 0.562273I$ | | |
| $u = \phantom{-}0.469463 + 0.153072I$ | | |
| $a = -0.049678 - 0.731363I$ | $-1.97373 - 0.10861I$ | $-3.92335 - 0.27922I$ |
| $b = -0.778060 - 0.142940I$ | | |
| $u = \phantom{-}0.469463 - 0.153072I$ | | |
| $a = -0.049678 + 0.731363I$ | $-1.97373 + 0.10861I$ | $-3.92335 + 0.27922I$ |
| $b = -0.778060 + 0.142940I$ | | |
| $u = -0.485133$ | | |
| $a = \phantom{-}1.38454$ | $1.33750$ | $7.76510$ |
| $b = \phantom{-}0.545168$ | | |

**II.** $I_2^u = \langle -3.53 \times 10^5 au^{46} - 5.12 \times 10^6 u^{46} + \cdots - 1.76 \times 10^6 a + 4.39 \times 10^6, \ -u^{46}a - 4u^{46} + \cdots + 4a - 2, \ u^{47} - 2u^{46} + \cdots - 2u + 1 \rangle$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} u^7 + 2u^5 + 2u^3 + 2u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ 0.0812428au^{46} + 1.17889u^{46} + \cdots + 0.405981a - 1.01104 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.518544au^{46} - 0.210245u^{46} + \cdots + 0.695338a - 2.12702 \\ 0.532249au^{46} + 0.655745u^{46} + \cdots - 0.0802495a - 1.01291 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.695287au^{46} - 0.870005u^{46} + \cdots + 0.393056a + 3.69548 \\ -1.22640au^{46} - 0.919210u^{46} + \cdots + 1.42747a + 3.22755 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.0795135au^{46} - 3.46239u^{46} + \cdots + 0.264558a + 2.53391 \\ -0.263752au^{46} - 4.29780u^{46} + \cdots + 0.193759a + 4.16617 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.728387au^{46} - 1.21723u^{46} + \cdots + 0.997171a - 0.164785 \\ -0.241660au^{46} + 0.367629u^{46} + \cdots + 0.306498a + 0.125823 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -9u^{46} + 12u^{45} + \cdots - 25u^3 + 11$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $(u^{47} + 16u^{46} + \cdots + 6u - 1)^2$ |
| $c_2, c_6$ | $(u^{47} + 2u^{46} + \cdots - 2u - 1)^2$ |
| $c_3, c_9$ | $u^{94} + 2u^{93} + \cdots - 1357u + 617$ |
| $c_4, c_8$ | $u^{94} + 2u^{93} + \cdots - 5u - 1$ |
| $c_7$ | $(u^{47} - 15u^{46} + \cdots + 584u - 64)^2$ |
| $c_{10}, c_{12}$ | $u^{94} - 5u^{93} + \cdots - 1230u - 479$ |
| $c_{11}$ | $(u^{47} - 23u^{46} + \cdots + 6u - 4)^2$ |

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

| Crossings | Riley Polynomials at each crossing |
| --- | --- |
| $c_1, c_5$ | $(y^{47} + 32y^{46} + \cdots + 54y - 1)^2$ |
| $c_2, c_6$ | $(y^{47} + 16y^{46} + \cdots + 6y - 1)^2$ |
| $c_3, c_9$ | $y^{94} + 88y^{92} + \cdots - 24281739y + 380689$ |
| $c_4, c_8$ | $y^{94} + 20y^{93} + \cdots - 95y + 1$ |
| $c_7$ | $(y^{47} + 11y^{46} + \cdots + 4032y - 4096)^2$ |
| $c_{10}, c_{12}$ | $y^{94} + 23y^{93} + \cdots - 3235384y + 229441$ |
| $c_{11}$ | $(y^{47} - 5y^{46} + \cdots + 364y - 16)^2$ |

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

| | Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|---|
| $u =$ | $0.772143 + 0.642996I$ | | |
| $a =$ | $2.23948 - 0.62237I$ | $-0.36535 - 5.41817I$ | $-3.72177 + 5.83848I$ |
| $b =$ | $1.82124 + 0.57008I$ | | |
| $u =$ | $0.772143 + 0.642996I$ | | |
| $a =$ | $-1.95406 - 1.42975I$ | $-0.36535 - 5.41817I$ | $-3.72177 + 5.83848I$ |
| $b =$ | $-1.57524 - 1.57601I$ | | |
| $u =$ | $0.772143 - 0.642996I$ | | |
| $a =$ | $2.23948 + 0.62237I$ | $-0.36535 + 5.41817I$ | $-3.72177 - 5.83848I$ |
| $b =$ | $1.82124 - 0.57008I$ | | |
| $u =$ | $0.772143 - 0.642996I$ | | |
| $a =$ | $-1.95406 + 1.42975I$ | $-0.36535 + 5.41817I$ | $-3.72177 - 5.83848I$ |
| $b =$ | $-1.57524 + 1.57601I$ | | |
| $u =$ | $0.065823 + 0.985795I$ | | |
| $a =$ | $-0.794525 + 0.145636I$ | $-1.81519 + 5.22959I$ | $-3.91168 - 9.23109I$ |
| $b =$ | $2.39330 - 0.83626I$ | | |
| $u =$ | $0.065823 + 0.985795I$ | | |
| $a =$ | $-0.11431 + 2.05371I$ | $-1.81519 + 5.22959I$ | $-3.91168 - 9.23109I$ |
| $b =$ | $-0.289829 - 1.141580I$ | | |
| $u =$ | $0.065823 - 0.985795I$ | | |
| $a =$ | $-0.794525 - 0.145636I$ | $-1.81519 - 5.22959I$ | $-3.91168 + 9.23109I$ |
| $b =$ | $2.39330 + 0.83626I$ | | |
| $u =$ | $0.065823 - 0.985795I$ | | |
| $a =$ | $-0.11431 - 2.05371I$ | $-1.81519 - 5.22959I$ | $-3.91168 + 9.23109I$ |
| $b =$ | $-0.289829 + 1.141580I$ | | |
| $u =$ | $0.670790 + 0.783645I$ | | |
| $a =$ | $-0.161907 + 0.672913I$ | $2.06177 + 5.42127I$ | $-0.51305 - 9.04370I$ |
| $b =$ | $0.351390 + 1.295530I$ | | |
| $u =$ | $0.670790 + 0.783645I$ | | |
| $a =$ | $-3.09541 + 0.33327I$ | $2.06177 + 5.42127I$ | $-0.51305 - 9.04370I$ |
| $b =$ | $-1.80019 - 1.46614I$ | | |

| Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.670790 - 0.783645I$ <br> $a = -0.161907 - 0.672913I$ <br> $b = \phantom{-}0.351390 - 1.295530I$ | $2.06177 - 5.42127I$ | $-0.51305 + 9.04370I$ |
| $u = \phantom{-}0.670790 - 0.783645I$ <br> $a = -3.09541 - 0.33327I$ <br> $b = -1.80019 + 1.46614I$ | $2.06177 - 5.42127I$ | $-0.51305 + 9.04370I$ |
| $u = -0.757991 + 0.707290I$ <br> $a = \phantom{-}0.368122 + 0.935352I$ <br> $b = \phantom{-}0.05350 + 1.55347I$ | $3.76799 + 4.92764I$ | $5.40903 - 6.45647I$ |
| $u = -0.757991 + 0.707290I$ <br> $a = -2.86375 + 1.71519I$ <br> $b = -1.40822 + 2.25640I$ | $3.76799 + 4.92764I$ | $5.40903 - 6.45647I$ |
| $u = -0.757991 - 0.707290I$ <br> $a = \phantom{-}0.368122 - 0.935352I$ <br> $b = \phantom{-}0.05350 - 1.55347I$ | $3.76799 - 4.92764I$ | $5.40903 + 6.45647I$ |
| $u = -0.757991 - 0.707290I$ <br> $a = -2.86375 - 1.71519I$ <br> $b = -1.40822 - 2.25640I$ | $3.76799 - 4.92764I$ | $5.40903 + 6.45647I$ |
| $u = -0.321739 + 0.904434I$ <br> $a = -0.752471 - 0.181737I$ <br> $b = -0.441533 - 0.190699I$ | $-1.49879 - 2.72703I$ | $0.31803 + 10.40316I$ |
| $u = -0.321739 + 0.904434I$ <br> $a = \phantom{-}0.83846 - 1.53264I$ <br> $b = -1.206220 - 0.369321I$ | $-1.49879 - 2.72703I$ | $0.31803 + 10.40316I$ |
| $u = -0.321739 - 0.904434I$ <br> $a = -0.752471 + 0.181737I$ <br> $b = -0.441533 + 0.190699I$ | $-1.49879 + 2.72703I$ | $0.31803 - 10.40316I$ |
| $u = -0.321739 - 0.904434I$ <br> $a = \phantom{-}0.83846 + 1.53264I$ <br> $b = -1.206220 + 0.369321I$ | $-1.49879 + 2.72703I$ | $0.31803 - 10.40316I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.745676 + 0.749598I$ <br> $a = \phantom{-}0.594496 + 0.931998I$ <br> $b = \phantom{-}1.122390 - 0.539463I$ | $4.39717 - 3.62571I$ | $7.53098 + 3.80616I$ |
| $u = -0.745676 + 0.749598I$ <br> $a = \phantom{-}2.08257 - 1.70821I$ <br> $b = \phantom{-}1.44620 - 1.97237I$ | $4.39717 - 3.62571I$ | $7.53098 + 3.80616I$ |
| $u = -0.745676 - 0.749598I$ <br> $a = \phantom{-}0.594496 - 0.931998I$ <br> $b = \phantom{-}1.122390 + 0.539463I$ | $4.39717 + 3.62571I$ | $7.53098 - 3.80616I$ |
| $u = -0.745676 - 0.749598I$ <br> $a = \phantom{-}2.08257 + 1.70821I$ <br> $b = \phantom{-}1.44620 + 1.97237I$ | $4.39717 + 3.62571I$ | $7.53098 - 3.80616I$ |
| $u = \phantom{-}0.835576 + 0.654367I$ <br> $a = -1.149220 - 0.808852I$ <br> $b = -1.01681 - 1.08095I$ | $3.17815 - 6.17661I$ | $6.08040 + 7.08127I$ |
| $u = \phantom{-}0.835576 + 0.654367I$ <br> $a = \phantom{-}2.04035 + 0.90725I$ <br> $b = \phantom{-}1.49419 + 1.19628I$ | $3.17815 - 6.17661I$ | $6.08040 + 7.08127I$ |
| $u = \phantom{-}0.835576 - 0.654367I$ <br> $a = -1.149220 + 0.808852I$ <br> $b = -1.01681 + 1.08095I$ | $3.17815 + 6.17661I$ | $6.08040 - 7.08127I$ |
| $u = \phantom{-}0.835576 - 0.654367I$ <br> $a = \phantom{-}2.04035 - 0.90725I$ <br> $b = \phantom{-}1.49419 - 1.19628I$ | $3.17815 + 6.17661I$ | $6.08040 - 7.08127I$ |
| $u = -0.068239 + 1.072380I$ <br> $a = -1.171150 - 0.335843I$ <br> $b = \phantom{-}1.86850 + 0.88154I$ | $-6.27292 - 4.92429I$ | $-11.80612 + 6.60421I$ |
| $u = -0.068239 + 1.072380I$ <br> $a = \phantom{-}0.361183 + 0.154733I$ <br> $b = -1.61240 + 0.76863I$ | $-6.27292 - 4.92429I$ | $-11.80612 + 6.60421I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.068239 - 1.072380I$ <br> $a = -1.171150 + 0.335843I$ <br> $b = \phantom{-}1.86850 - 0.88154I$ | $-6.27292 + 4.92429I$ | $-11.80612 - 6.60421I$ |
| $u = -0.068239 - 1.072380I$ <br> $a = \phantom{-}0.361183 - 0.154733I$ <br> $b = -1.61240 - 0.76863I$ | $-6.27292 + 4.92429I$ | $-11.80612 - 6.60421I$ |
| $u = \phantom{-}0.772491 + 0.749634I$ <br> $a = \phantom{-}0.598374 + 0.785507I$ <br> $b = -0.279711 + 0.391763I$ | $4.50657 - 1.10565I$ | $7.26389 + 0.73525I$ |
| $u = \phantom{-}0.772491 + 0.749634I$ <br> $a = \phantom{-}1.70588 + 0.49021I$ <br> $b = \phantom{-}1.226170 + 0.551106I$ | $4.50657 - 1.10565I$ | $7.26389 + 0.73525I$ |
| $u = \phantom{-}0.772491 - 0.749634I$ <br> $a = \phantom{-}0.598374 - 0.785507I$ <br> $b = -0.279711 - 0.391763I$ | $4.50657 + 1.10565I$ | $7.26389 - 0.73525I$ |
| $u = \phantom{-}0.772491 - 0.749634I$ <br> $a = \phantom{-}1.70588 - 0.49021I$ <br> $b = \phantom{-}1.226170 - 0.551106I$ | $4.50657 + 1.10565I$ | $7.26389 - 0.73525I$ |
| $u = -0.130958 + 1.104210I$ <br> $a = -0.648999 - 0.190098I$ <br> $b = \phantom{-}0.996603 + 0.502190I$ | $-3.46438 - 5.71911I$ | $0. + 10.73754I$ |
| $u = -0.130958 + 1.104210I$ <br> $a = \phantom{-}0.586734 - 0.214829I$ <br> $b = -1.80970 - 0.34810I$ | $-3.46438 - 5.71911I$ | $0. + 10.73754I$ |
| $u = -0.130958 - 1.104210I$ <br> $a = -0.648999 + 0.190098I$ <br> $b = \phantom{-}0.996603 - 0.502190I$ | $-3.46438 + 5.71911I$ | $0. - 10.73754I$ |
| $u = -0.130958 - 1.104210I$ <br> $a = \phantom{-}0.586734 + 0.214829I$ <br> $b = -1.80970 + 0.34810I$ | $-3.46438 + 5.71911I$ | $0. - 10.73754I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.040229 + 0.879504I$ | | |
| $a = -0.287572 - 1.222140I$ | $-0.76455 - 2.60705I$ | $-1.60051 + 0.53932I$ |
| $b = -0.383448 - 0.507173I$ | | |
| $u = \phantom{-}0.040229 + 0.879504I$ | | |
| $a = \phantom{-}1.77466 - 0.86226I$ | $-0.76455 - 2.60705I$ | $-1.60051 + 0.53932I$ |
| $b = -1.47969 + 0.88535I$ | | |
| $u = \phantom{-}0.040229 - 0.879504I$ | | |
| $a = -0.287572 + 1.222140I$ | $-0.76455 + 2.60705I$ | $-1.60051 - 0.53932I$ |
| $b = -0.383448 + 0.507173I$ | | |
| $u = \phantom{-}0.040229 - 0.879504I$ | | |
| $a = \phantom{-}1.77466 + 0.86226I$ | $-0.76455 + 2.60705I$ | $-1.60051 - 0.53932I$ |
| $b = -1.47969 - 0.88535I$ | | |
| $u = \phantom{-}0.660122 + 0.938453I$ | | |
| $a = \phantom{-}1.78287 + 0.59230I$ | $1.57017 - 0.25942I$ | $-1.06368 + 3.01037I$ |
| $b = -0.497549 + 1.192870I$ | | |
| $u = \phantom{-}0.660122 + 0.938453I$ | | |
| $a = \phantom{-}1.13707 - 2.93123I$ | $1.57017 - 0.25942I$ | $-1.06368 + 3.01037I$ |
| $b = \phantom{-}2.52010 - 1.14200I$ | | |
| $u = \phantom{-}0.660122 - 0.938453I$ | | |
| $a = \phantom{-}1.78287 - 0.59230I$ | $1.57017 + 0.25942I$ | $-1.06368 - 3.01037I$ |
| $b = -0.497549 - 1.192870I$ | | |
| $u = \phantom{-}0.660122 - 0.938453I$ | | |
| $a = \phantom{-}1.13707 + 2.93123I$ | $1.57017 + 0.25942I$ | $-1.06368 - 3.01037I$ |
| $b = \phantom{-}2.52010 + 1.14200I$ | | |
| $u = -0.505950 + 1.033790I$ | | |
| $a = \phantom{-}0.288704 + 0.762750I$ | $-1.20472 - 1.09384I$ | $8.06325 - 6.83134I$ |
| $b = \phantom{-}0.420531 - 0.175980I$ | | |
| $u = -0.505950 + 1.033790I$ | | |
| $a = \phantom{-}0.02739 - 1.62004I$ | $-1.20472 - 1.09384I$ | $8.06325 - 6.83134I$ |
| $b = -1.061970 - 0.621817I$ | | |

| Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.505950 - 1.033790I$ $a = \phantom{-}0.288704 - 0.762750I$ $b = \phantom{-}0.420531 + 0.175980I$ | $-1.20472 + 1.09384I$ | $8.06325 + 6.83134I$ |
| $u = -0.505950 - 1.033790I$ $a = \phantom{-}0.02739 + 1.62004I$ $b = -1.061970 + 0.621817I$ | $-1.20472 + 1.09384I$ | $8.06325 + 6.83134I$ |
| $u = -0.592721 + 1.003590I$ $a = \phantom{-}0.91940 - 1.82547I$ $b = -0.32920 - 1.50045I$ | $-3.12533 - 1.32118I$ | $-9.86172 - 1.87297I$ |
| $u = -0.592721 + 1.003590I$ $a = \phantom{-}0.98493 + 1.90479I$ $b = \phantom{-}1.44789 - 0.16408I$ | $-3.12533 - 1.32118I$ | $-9.86172 - 1.87297I$ |
| $u = -0.592721 - 1.003590I$ $a = \phantom{-}0.91940 + 1.82547I$ $b = -0.32920 + 1.50045I$ | $-3.12533 + 1.32118I$ | $-9.86172 + 1.87297I$ |
| $u = -0.592721 - 1.003590I$ $a = \phantom{-}0.98493 - 1.90479I$ $b = \phantom{-}1.44789 + 0.16408I$ | $-3.12533 + 1.32118I$ | $-9.86172 + 1.87297I$ |
| $u = \phantom{-}0.796351 + 0.877178I$ $a = \phantom{-}0.318920 + 0.558060I$ $b = -0.401394 + 0.125062I$ | $7.14398 + 2.97736I$ | $10.10091 - 3.12468I$ |
| $u = \phantom{-}0.796351 + 0.877178I$ $a = \phantom{-}0.061883 + 0.240083I$ $b = \phantom{-}0.407103 + 0.385543I$ | $7.14398 + 2.97736I$ | $10.10091 - 3.12468I$ |
| $u = \phantom{-}0.796351 - 0.877178I$ $a = \phantom{-}0.318920 - 0.558060I$ $b = -0.401394 - 0.125062I$ | $7.14398 - 2.97736I$ | $10.10091 + 3.12468I$ |
| $u = \phantom{-}0.796351 - 0.877178I$ $a = \phantom{-}0.061883 - 0.240083I$ $b = \phantom{-}0.407103 - 0.385543I$ | $7.14398 - 2.97736I$ | $10.10091 + 3.12468I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.704160 + 0.960383I$ | | |
| $a = -0.259940 - 0.426803I$ | $3.75387 - 1.89878I$ | $5.76587 + 2.06655I$ |
| $b = -1.320450 - 0.145118I$ | | |
| $u = -0.704160 + 0.960383I$ | | |
| $a = \phantom{-}0.92784 - 3.27718I$ | $3.75387 - 1.89878I$ | $5.76587 + 2.06655I$ |
| $b = -1.76239 - 1.90494I$ | | |
| $u = -0.704160 - 0.960383I$ | | |
| $a = -0.259940 + 0.426803I$ | $3.75387 + 1.89878I$ | $5.76587 - 2.06655I$ |
| $b = -1.320450 + 0.145118I$ | | |
| $u = -0.704160 - 0.960383I$ | | |
| $a = \phantom{-}0.92784 + 3.27718I$ | $3.75387 + 1.89878I$ | $5.76587 - 2.06655I$ |
| $b = -1.76239 + 1.90494I$ | | |
| $u = \phantom{-}0.718348 + 0.965153I$ | | |
| $a = \phantom{-}0.131396 + 0.525117I$ | $3.84804 + 6.74938I$ | $5.58868 - 6.17473I$ |
| $b = \phantom{-}0.283757 + 0.615978I$ | | |
| $u = \phantom{-}0.718348 + 0.965153I$ | | |
| $a = -0.63010 + 2.24866I$ | $3.84804 + 6.74938I$ | $5.58868 - 6.17473I$ |
| $b = -1.49467 + 0.56145I$ | | |
| $u = \phantom{-}0.718348 - 0.965153I$ | | |
| $a = \phantom{-}0.131396 - 0.525117I$ | $3.84804 - 6.74938I$ | $5.58868 + 6.17473I$ |
| $b = \phantom{-}0.283757 - 0.615978I$ | | |
| $u = \phantom{-}0.718348 - 0.965153I$ | | |
| $a = -0.63010 - 2.24866I$ | $3.84804 - 6.74938I$ | $5.58868 + 6.17473I$ |
| $b = -1.49467 - 0.56145I$ | | |
| $u = -0.700956 + 0.987558I$ | | |
| $a = -2.01581 + 0.26450I$ | $2.91955 - 10.47790I$ | $3.11327 + 11.61269I$ |
| $b = \phantom{-}0.076435 + 1.404510I$ | | |
| $u = -0.700956 + 0.987558I$ | | |
| $a = -0.66356 + 3.49438I$ | $2.91955 - 10.47790I$ | $3.11327 + 11.61269I$ |
| $b = \phantom{-}1.95608 + 2.44853I$ | | |

| Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.700956 - 0.987558I$ <br> $a = -2.01581 - 0.26450I$ <br> $b = \phantom{-}0.076435 - 1.404510I$ | $2.91955 + 10.47790I$ | $3.11327 - 11.61269I$ |
| $u = -0.700956 - 0.987558I$ <br> $a = -0.66356 - 3.49438I$ <br> $b = \phantom{-}1.95608 - 2.44853I$ | $2.91955 + 10.47790I$ | $3.11327 - 11.61269I$ |
| $u = \phantom{-}0.690939 + 1.018760I$ <br> $a = -1.12961 + 2.00203I$ <br> $b = -2.36330 + 0.39658I$ | $-1.48582 + 10.96820I$ | $-5.73761 - 10.34128I$ |
| $u = \phantom{-}0.690939 + 1.018760I$ <br> $a = -0.70651 - 3.00542I$ <br> $b = \phantom{-}1.87813 - 1.65600I$ | $-1.48582 + 10.96820I$ | $-5.73761 - 10.34128I$ |
| $u = \phantom{-}0.690939 - 1.018760I$ <br> $a = -1.12961 - 2.00203I$ <br> $b = -2.36330 - 0.39658I$ | $-1.48582 - 10.96820I$ | $-5.73761 + 10.34128I$ |
| $u = \phantom{-}0.690939 - 1.018760I$ <br> $a = -0.70651 + 3.00542I$ <br> $b = \phantom{-}1.87813 + 1.65600I$ | $-1.48582 - 10.96820I$ | $-5.73761 + 10.34128I$ |
| $u = -0.709255 + 0.256293I$ <br> $a = -0.602810 - 0.317048I$ <br> $b = -0.504753 - 0.560887I$ | $1.03622 - 3.27383I$ | $9.01134 + 8.23853I$ |
| $u = -0.709255 + 0.256293I$ <br> $a = \phantom{-}1.58630 - 0.15907I$ <br> $b = \phantom{-}0.991234 + 0.147920I$ | $1.03622 - 3.27383I$ | $9.01134 + 8.23853I$ |
| $u = -0.709255 - 0.256293I$ <br> $a = -0.602810 + 0.317048I$ <br> $b = -0.504753 + 0.560887I$ | $1.03622 + 3.27383I$ | $9.01134 - 8.23853I$ |
| $u = -0.709255 - 0.256293I$ <br> $a = \phantom{-}1.58630 + 0.15907I$ <br> $b = \phantom{-}0.991234 - 0.147920I$ | $1.03622 + 3.27383I$ | $9.01134 - 8.23853I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.718603 + 1.036020I$<br>$a = -0.44695 - 1.78971I$<br>$b = \phantom{-}1.24131 - 1.08106I$ | $2.01774 + 11.99080I$ | $0. - 11.87939I$ |
| $u = \phantom{-}0.718603 + 1.036020I$<br>$a = \phantom{-}0.01022 + 2.58701I$<br>$b = -1.80260 + 1.32253I$ | $2.01774 + 11.99080I$ | $0. - 11.87939I$ |
| $u = \phantom{-}0.718603 - 1.036020I$<br>$a = -0.44695 + 1.78971I$<br>$b = \phantom{-}1.24131 + 1.08106I$ | $2.01774 - 11.99080I$ | $0. + 11.87939I$ |
| $u = \phantom{-}0.718603 - 1.036020I$<br>$a = \phantom{-}0.01022 - 2.58701I$<br>$b = -1.80260 - 1.32253I$ | $2.01774 - 11.99080I$ | $0. + 11.87939I$ |
| $u = -0.596911 + 0.421542I$<br>$a = -1.54344 - 0.54636I$<br>$b = -1.159750 - 0.623127I$ | $-1.66205 - 3.33681I$ | $-4.87506 + 7.62978I$ |
| $u = -0.596911 + 0.421542I$<br>$a = \phantom{-}1.19145 - 1.77959I$<br>$b = \phantom{-}0.282395 - 0.518869I$ | $-1.66205 - 3.33681I$ | $-4.87506 + 7.62978I$ |
| $u = -0.596911 - 0.421542I$<br>$a = -1.54344 + 0.54636I$<br>$b = -1.159750 + 0.623127I$ | $-1.66205 + 3.33681I$ | $-4.87506 - 7.62978I$ |
| $u = -0.596911 - 0.421542I$<br>$a = \phantom{-}1.19145 + 1.77959I$<br>$b = \phantom{-}0.282395 + 0.518869I$ | $-1.66205 + 3.33681I$ | $-4.87506 - 7.62978I$ |
| $u = -0.557302$<br>$a = \phantom{-}1.21547$<br>$b = \phantom{-}0.121806$ | $1.15522$ | $8.68310$ |
| $u = -0.557302$<br>$a = \phantom{-}1.63842$<br>$b = \phantom{-}1.14422$ | $1.15522$ | $8.68310$ |

| | Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|---|
| $u =$ | $0.371791 + 0.088614I$ | | |
| $a =$ | $1.54496 + 0.38373I$ | $1.44196 + 3.94940I$ | $9.27313 - 7.93438I$ |
| $b =$ | $0.69756 + 1.33020I$ | | |
| $u =$ | $0.371791 + 0.088614I$ | | |
| $a =$ | $-3.03847 - 1.45398I$ | $1.44196 + 3.94940I$ | $9.27313 - 7.93438I$ |
| $b =$ | $-0.608030 + 0.449499I$ | | |
| $u =$ | $0.371791 - 0.088614I$ | | |
| $a =$ | $1.54496 - 0.38373I$ | $1.44196 - 3.94940I$ | $9.27313 + 7.93438I$ |
| $b =$ | $0.69756 - 1.33020I$ | | |
| $u =$ | $0.371791 - 0.088614I$ | | |
| $a =$ | $-3.03847 + 1.45398I$ | $1.44196 - 3.94940I$ | $9.27313 + 7.93438I$ |
| $b =$ | $-0.608030 - 0.449499I$ | | |

**III.**

$$I_3^u = \langle u^{22}+u^{21}+\cdots+b+3u,\ u^{23}-2u^{22}+\cdots+a+3,\ u^{24}-2u^{23}+\cdots+7u^2+1 \rangle$$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} u^7 + 2u^5 + 2u^3 + 2u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{23} + 2u^{22} + \cdots - 6u - 3 \\ -u^{22} - u^{21} + \cdots - 4u^2 - 3u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -2u^{23} + 4u^{22} + \cdots - 6u - 2 \\ -u^{21} + u^{20} + \cdots - u + 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^{23} - u^{22} + \cdots - 6u + 1 \\ u^{23} - 3u^{22} + \cdots - u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^{23} + u^{22} + \cdots + 2u + 5 \\ 3u^{23} - 4u^{22} + \cdots + 4u - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^{23} + 2u^{22} + \cdots - 6u - 2 \\ -u^{21} + u^{20} + \cdots - 2u + 1 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= 18u^{23} - 25u^{22} + 84u^{21} - 88u^{20} + 249u^{19} - 231u^{18} + 501u^{17} - 393u^{16} + 767u^{15} - 511u^{14} + 903u^{13} - 510u^{12} + 836u^{11} - 370u^{10} + 609u^9 - 232u^8 + 351u^7 - 103u^6 + 161u^5 - 70u^4 + 77u^3 - 52u^2 + 22u - 9$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{24} - 8u^{23} + \cdots - 14u + 1$ |
| $c_2$ | $u^{24} - 2u^{23} + \cdots + 7u^2 + 1$ |
| $c_3, c_9$ | $u^{24} + u^{23} + \cdots + 6u^2 + 1$ |
| $c_4, c_8$ | $u^{24} + 6u^{22} + \cdots - u + 1$ |
| $c_6$ | $u^{24} + 2u^{23} + \cdots + 7u^2 + 1$ |
| $c_7$ | $u^{24} - 10u^{23} + \cdots - 60u + 13$ |
| $c_{10}, c_{12}$ | $u^{24} + 7u^{23} + \cdots + 12u + 1$ |
| $c_{11}$ | $u^{24} - 17u^{23} + \cdots - 159u + 13$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y^{24} + 20y^{23} + \cdots - 38y + 1$ |
| $c_2, c_6$ | $y^{24} + 8y^{23} + \cdots + 14y + 1$ |
| $c_3, c_9$ | $y^{24} + 7y^{23} + \cdots + 12y + 1$ |
| $c_4, c_8$ | $y^{24} + 12y^{23} + \cdots + 7y + 1$ |
| $c_7$ | $y^{24} - 8y^{23} + \cdots + 3316y + 169$ |
| $c_{10}, c_{12}$ | $y^{24} + 15y^{23} + \cdots - 16y + 1$ |
| $c_{11}$ | $y^{24} + 5y^{23} + \cdots + 1941y + 169$ |

### (vi) Complex Volumes and Cusp Shapes

| Solutions to $I_3^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.783109 + 0.655543I$<br>$a = -1.90898 - 0.95090I$<br>$b = -1.41891 - 1.49164I$ | $1.38748 - 5.46519I$ | $2.50414 + 5.64098I$ |
| $u = \phantom{-}0.783109 - 0.655543I$<br>$a = -1.90898 + 0.95090I$<br>$b = -1.41891 + 1.49164I$ | $1.38748 + 5.46519I$ | $2.50414 - 5.64098I$ |
| $u = \phantom{-}0.722134 + 0.771620I$<br>$a = \phantom{-}1.56857 + 0.44185I$<br>$b = \phantom{-}1.33569 + 1.71663I$ | $3.32921 + 4.65722I$ | $4.55642 - 7.86836I$ |
| $u = \phantom{-}0.722134 - 0.771620I$<br>$a = \phantom{-}1.56857 - 0.44185I$<br>$b = \phantom{-}1.33569 - 1.71663I$ | $3.32921 - 4.65722I$ | $4.55642 + 7.86836I$ |
| $u = -0.087858 + 1.075070I$<br>$a = -0.697208 - 0.281594I$<br>$b = \phantom{-}1.55008 + 0.42215I$ | $-4.67521 - 5.07247I$ | $-5.72982 + 6.40556I$ |
| $u = -0.087858 - 1.075070I$<br>$a = -0.697208 + 0.281594I$<br>$b = \phantom{-}1.55008 - 0.42215I$ | $-4.67521 + 5.07247I$ | $-5.72982 - 6.40556I$ |
| $u = -0.744007 + 0.782170I$<br>$a = \phantom{-}1.64417 + 0.32394I$<br>$b = \phantom{-}0.816926 - 0.127063I$ | $3.55737 + 2.59657I$ | $2.55184 - 4.16828I$ |
| $u = -0.744007 - 0.782170I$<br>$a = \phantom{-}1.64417 - 0.32394I$<br>$b = \phantom{-}0.816926 + 0.127063I$ | $3.55737 - 2.59657I$ | $2.55184 + 4.16828I$ |
| $u = \phantom{-}0.010799 + 0.915059I$<br>$a = \phantom{-}0.46203 + 1.54084I$<br>$b = -1.41632 - 0.54217I$ | $-1.29285 + 3.71864I$ | $-4.48788 - 6.49334I$ |
| $u = \phantom{-}0.010799 - 0.915059I$<br>$a = \phantom{-}0.46203 - 1.54084I$<br>$b = -1.41632 + 0.54217I$ | $-1.29285 - 3.71864I$ | $-4.48788 + 6.49334I$ |

| Solutions to $I_3^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.552898 + 1.014130I$ <br> $a = \phantom{-}0.129679 + 1.406560I$ <br> $b = \phantom{-}0.768179 + 0.377090I$ | $-1.86115 - 1.33351I$ | $-5.25361 - 0.66855I$ |
| $u = -0.552898 - 1.014130I$ <br> $a = \phantom{-}0.129679 - 1.406560I$ <br> $b = \phantom{-}0.768179 - 0.377090I$ | $-1.86115 + 1.33351I$ | $-5.25361 + 0.66855I$ |
| $u = \phantom{-}0.694951 + 0.945102I$ <br> $a = \phantom{-}0.70843 + 2.09621I$ <br> $b = -1.69527 + 1.53542I$ | $2.79501 + 0.77128I$ | $2.92731 + 2.21034I$ |
| $u = \phantom{-}0.694951 - 0.945102I$ <br> $a = \phantom{-}0.70843 - 2.09621I$ <br> $b = -1.69527 - 1.53542I$ | $2.79501 - 0.77128I$ | $2.92731 - 2.21034I$ |
| $u = -0.710362 + 0.947085I$ <br> $a = -1.26576 - 1.33668I$ <br> $b = -1.044050 - 0.205193I$ | $3.04601 - 8.14001I$ | $1.19401 + 10.31197I$ |
| $u = -0.710362 - 0.947085I$ <br> $a = -1.26576 + 1.33668I$ <br> $b = -1.044050 + 0.205193I$ | $3.04601 + 8.14001I$ | $1.19401 - 10.31197I$ |
| $u = \phantom{-}0.700024 + 1.017760I$ <br> $a = -0.36276 - 2.53749I$ <br> $b = \phantom{-}1.85064 - 1.46863I$ | $0.30274 + 11.07770I$ | $0.61856 - 10.05231I$ |
| $u = \phantom{-}0.700024 - 1.017760I$ <br> $a = -0.36276 + 2.53749I$ <br> $b = \phantom{-}1.85064 + 1.46863I$ | $0.30274 - 11.07770I$ | $0.61856 + 10.05231I$ |
| $u = -0.659109 + 0.381913I$ <br> $a = -1.157770 + 0.055314I$ <br> $b = -0.615488 - 0.234859I$ | $-0.07986 - 3.24341I$ | $0.45676 + 7.76742I$ |
| $u = -0.659109 - 0.381913I$ <br> $a = -1.157770 - 0.055314I$ <br> $b = -0.615488 + 0.234859I$ | $-0.07986 + 3.24341I$ | $0.45676 - 7.76742I$ |

| Solutions to $I_3^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.873660 + 0.917557I$ $a = -0.062950 - 0.211590I$ $b = -0.0106167 - 0.0427477I$ | $7.80986 + 3.23033I$ | $-60.3385 - 17.9900I$ |
| $u = \phantom{-}0.873660 - 0.917557I$ $a = -0.062950 + 0.211590I$ $b = -0.0106167 + 0.0427477I$ | $7.80986 - 3.23033I$ | $-60.3385 + 17.9900I$ |
| $u = -0.030442 + 0.453632I$ $a = -2.05746 - 1.42608I$ $b = \phantom{-}0.379145 - 0.677721I$ | $0.48580 - 3.68590I$ | $-0.49927 + 5.76109I$ |
| $u = -0.030442 - 0.453632I$ $a = -2.05746 + 1.42608I$ $b = \phantom{-}0.379145 + 0.677721I$ | $0.48580 + 3.68590I$ | $-0.49927 - 5.76109I$ |

$$\textbf{IV. } \boldsymbol{I_4^u = \langle au + b + u + 1, \ a^2 - 3au - 3u - 2, \ u^2 + u + 1 \rangle}$$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ -u - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u \\ u + 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ -au - u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} au + a + u + 1 \\ -au - u - 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} a - u \\ -au - 2u - 2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u \\ a - 2u - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a - u \\ -au - 2u - 2 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= u - 3$

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

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

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

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

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

| Solutions to $I_4^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.500000 + 0.866025I$<br>$a = -1.121740 + 0.425428I$<br>$b = -0.692440 + 0.318148I$ | $-1.64493 - 2.02988I$ | $-3.50000 + 0.86603I$ |
| $u = -0.500000 + 0.866025I$<br>$a = -0.37826 + 2.17265I$<br>$b = \phantom{-}1.192440 + 0.547877I$ | $-1.64493 - 2.02988I$ | $-3.50000 + 0.86603I$ |
| $u = -0.500000 - 0.866025I$<br>$a = -1.121740 - 0.425428I$<br>$b = -0.692440 - 0.318148I$ | $-1.64493 + 2.02988I$ | $-3.50000 - 0.86603I$ |
| $u = -0.500000 - 0.866025I$<br>$a = -0.37826 - 2.17265I$<br>$b = \phantom{-}1.192440 - 0.547877I$ | $-1.64493 + 2.02988I$ | $-3.50000 - 0.86603I$ |

$$\text{V. } I_1^v = \langle a, \ b+1, \ v-1 \rangle$$

**(i) Arc colorings**

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

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

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

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

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

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_2, c_5$ $c_6, c_7, c_{11}$ | $y$ |
| $c_3, c_4, c_8$ $c_9, c_{10}, c_{12}$ | $y - 1$ |

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

| Solutions to $I_1^v$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $v = \quad 1.00000$ | | |
| $a = \qquad 0$ | $-1.64493$ | $-6.00000$ |
| $b = -1.00000$ | | |

## VI. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u(u^2 - u + 1)^2(u^{24} - 8u^{23} + \cdots - 14u + 1)$ <br> $\cdot((u^{47} + 16u^{46} + \cdots + 6u - 1)^2)(u^{69} + 23u^{68} + \cdots + 65u - 49)$ |
| $c_2$ | $u(u^2 + u + 1)^2(u^{24} - 2u^{23} + \cdots + 7u^2 + 1)(u^{47} + 2u^{46} + \cdots - 2u - 1)^2$ <br> $\cdot(u^{69} - 5u^{68} + \cdots - 11u - 7)$ |
| $c_3, c_9$ | $(u + 1)(u^4 + u^3 - u^2 - u + 1)(u^{24} + u^{23} + \cdots + 6u^2 + 1)$ <br> $\cdot(u^{69} - 2u^{68} + \cdots - 3u - 1)(u^{94} + 2u^{93} + \cdots - 1357u + 617)$ |
| $c_4, c_8$ | $(u + 1)(u^4 + u^3 - u^2 - u + 1)(u^{24} + 6u^{22} + \cdots - u + 1)$ <br> $\cdot(u^{69} - u^{68} + \cdots - 2u - 1)(u^{94} + 2u^{93} + \cdots - 5u - 1)$ |
| $c_6$ | $u(u^2 - u + 1)^2(u^{24} + 2u^{23} + \cdots + 7u^2 + 1)(u^{47} + 2u^{46} + \cdots - 2u - 1)^2$ <br> $\cdot(u^{69} - 5u^{68} + \cdots - 11u - 7)$ |
| $c_7$ | $u^5(u^{24} - 10u^{23} + \cdots - 60u + 13)(u^{47} - 15u^{46} + \cdots + 584u - 64)^2$ <br> $\cdot(u^{69} + 25u^{68} + \cdots - 59915u - 3703)$ |
| $c_{10}, c_{12}$ | $((u + 1)^5)(u^{24} + 7u^{23} + \cdots + 12u + 1)(u^{69} + 10u^{68} + \cdots + 29u - 1)$ <br> $\cdot(u^{94} - 5u^{93} + \cdots - 1230u - 479)$ |
| $c_{11}$ | $u^5(u^{24} - 17u^{23} + \cdots - 159u + 13)(u^{47} - 23u^{46} + \cdots + 6u - 4)^2$ <br> $\cdot(u^{69} + 38u^{68} + \cdots - 64u - 7)$ |

## VII. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y(y^2 + y + 1)^2(y^{24} + 20y^{23} + \cdots - 38y + 1)$ <br> $\cdot((y^{47} + 32y^{46} + \cdots + 54y - 1)^2)(y^{69} + 51y^{68} + \cdots + 29901y - 2401)$ |
| $c_2, c_6$ | $y(y^2 + y + 1)^2(y^{24} + 8y^{23} + \cdots + 14y + 1)$ <br> $\cdot((y^{47} + 16y^{46} + \cdots + 6y - 1)^2)(y^{69} + 23y^{68} + \cdots + 65y - 49)$ |
| $c_3, c_9$ | $(y - 1)(y^4 - 3y^3 + \cdots - 3y + 1)(y^{24} + 7y^{23} + \cdots + 12y + 1)$ <br> $\cdot(y^{69} - 6y^{68} + \cdots - 33y - 1)$ <br> $\cdot(y^{94} + 88y^{92} + \cdots - 24281739y + 380689)$ |
| $c_4, c_8$ | $(y - 1)(y^4 - 3y^3 + \cdots - 3y + 1)(y^{24} + 12y^{23} + \cdots + 7y + 1)$ <br> $\cdot(y^{69} - 29y^{68} + \cdots + 76y - 1)(y^{94} + 20y^{93} + \cdots - 95y + 1)$ |
| $c_7$ | $y^5(y^{24} - 8y^{23} + \cdots + 3316y + 169)$ <br> $\cdot(y^{47} + 11y^{46} + \cdots + 4032y - 4096)^2$ <br> $\cdot(y^{69} + 3y^{68} + \cdots - 816311009y - 13712209)$ |
| $c_{10}, c_{12}$ | $((y - 1)^5)(y^{24} + 15y^{23} + \cdots - 16y + 1)(y^{69} - 42y^{68} + \cdots + 27y - 1)$ <br> $\cdot(y^{94} + 23y^{93} + \cdots - 3235384y + 229441)$ |
| $c_{11}$ | $y^5(y^{24} + 5y^{23} + \cdots + 1941y + 169)(y^{47} - 5y^{46} + \cdots + 364y - 16)^2$ <br> $\cdot(y^{69} + 50y^{67} + \cdots + 134y - 49)$ |