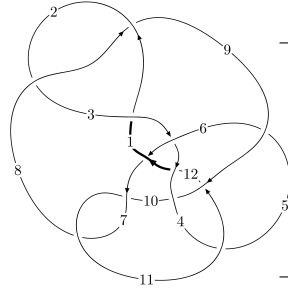
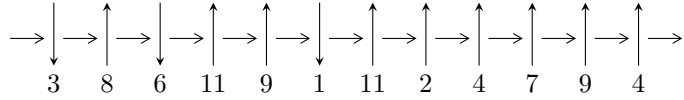


12n<sub>0619</sub> (K12n<sub>0619</sub>)



A knot diagram<sup>1</sup>

**Linearized knot diagram**



**Solving Sequence**

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

**Ideals for irreducible components<sup>2</sup> of  $X_{\text{par}}$**

$$I_1^u = \langle 4.28036 \times 10^{89} u^{71} + 6.03330 \times 10^{89} u^{70} + \dots + 9.62134 \times 10^{90} b + 1.51309 \times 10^{91}, \\ 2.28885 \times 10^{91} u^{71} - 3.14485 \times 10^{90} u^{70} + \dots + 1.25077 \times 10^{92} a - 5.93546 \times 10^{92}, u^{72} + u^{71} + \dots - 5u + 13 \rangle$$

$$I_2^u = \langle 58306u^{29} - 92181u^{28} + \dots + 145157b - 132553, \\ 213726u^{29} - 58787u^{28} + \dots + 145157a - 315469, u^{30} + 8u^{28} + \dots - 2u + 1 \rangle$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 102 representations.

<sup>1</sup>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>).

<sup>2</sup>All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I.

$$I_1^u = \langle 4.28 \times 10^{89} u^{71} + 6.03 \times 10^{89} u^{70} + \dots + 9.62 \times 10^{90} b + 1.51 \times 10^{91}, 2.29 \times 10^{91} u^{71} - 3.14 \times 10^{90} u^{70} + \dots + 1.25 \times 10^{92} a - 5.94 \times 10^{92}, u^{72} + u^{71} + \dots - 5u + 13 \rangle$$

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -0.182994u^{71} + 0.0251433u^{70} + \dots - 18.8680u + 4.74543 \\ -0.0444882u^{71} - 0.0627074u^{70} + \dots + 7.89374u - 1.57263 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.133370u^{71} + 0.0680367u^{70} + \dots - 7.84939u - 3.40355 \\ -0.00317815u^{71} + 0.0974739u^{70} + \dots - 5.89041u + 5.78176 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.150162u^{71} + 0.195372u^{70} + \dots - 15.9473u + 1.82218 \\ -0.0760366u^{71} + 0.0252163u^{70} + \dots - 5.90165u + 3.91591 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.453018u^{71} + 0.167249u^{70} + \dots + 12.8155u - 3.75646 \\ 0.215863u^{71} + 0.311273u^{70} + \dots - 4.36625u + 4.19897 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.188422u^{71} - 0.0605806u^{70} + \dots + 12.5787u + 0.355877 \\ -0.0375701u^{71} + 0.0536453u^{70} + \dots + 2.51828u - 2.99277 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.580665u^{71} - 0.174180u^{70} + \dots - 9.44693u + 5.13081 \\ -0.225939u^{71} - 0.372106u^{70} + \dots + 10.8961u - 6.94834 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.215107u^{71} - 0.0246516u^{70} + \dots - 19.2815u + 5.20660 \\ -0.0206372u^{71} - 0.0874849u^{70} + \dots + 7.80928u - 0.881593 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $1.23866u^{71} + 1.66942u^{70} + \dots + 6.74520u + 28.1649$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{72} + 29u^{71} + \dots + 1483u + 169$
$c_2, c_8$	$u^{72} + u^{71} + \dots - 5u + 13$
$c_3$	$u^{72} - 8u^{71} + \dots - 1454u + 103$
$c_4$	$u^{72} - 2u^{71} + \dots + 2563738u + 372821$
$c_5$	$u^{72} - 6u^{71} + \dots - 62302304u + 12968512$
$c_6$	$u^{72} + 2u^{71} + \dots - 81136u + 4448$
$c_7, c_{10}$	$u^{72} - 3u^{71} + \dots - 11u - 1$
$c_9$	$u^{72} + u^{71} + \dots - 77411u - 34673$
$c_{11}$	$u^{72} + 7u^{71} + \dots - 7376u - 2363$
$c_{12}$	$u^{72} + 10u^{71} + \dots - 582696u - 825103$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{72} + 41y^{71} + \dots - 4031249y + 28561$
$c_2, c_8$	$y^{72} + 29y^{71} + \dots + 1483y + 169$
$c_3$	$y^{72} + 8y^{71} + \dots + 86788y + 10609$
$c_4$	$y^{72} - 108y^{71} + \dots - 1786672638490y + 138995498041$
$c_5$	$y^{72} - 78y^{71} + \dots + 6347781005638656y + 168182303494144$
$c_6$	$y^{72} + 24y^{71} + \dots - 1766542592y + 19784704$
$c_7, c_{10}$	$y^{72} - 63y^{71} + \dots + 91y + 1$
$c_9$	$y^{72} - 99y^{71} + \dots - 7903121y + 1202216929$
$c_{11}$	$y^{72} - 105y^{71} + \dots - 197872558y + 5583769$
$c_{12}$	$y^{72} - 56y^{71} + \dots - 78126375735346y + 680794960609$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.808887 + 0.575194I$ $a = -0.684141 - 1.018880I$ $b = -1.59723 + 0.99383I$	$4.62016 + 3.05851I$	0
$u = -0.808887 - 0.575194I$ $a = -0.684141 + 1.018880I$ $b = -1.59723 - 0.99383I$	$4.62016 - 3.05851I$	0
$u = -0.696036 + 0.740230I$ $a = -0.037316 - 0.349653I$ $b = 1.31015 + 0.85715I$	$6.64464 - 3.46257I$	0
$u = -0.696036 - 0.740230I$ $a = -0.037316 + 0.349653I$ $b = 1.31015 - 0.85715I$	$6.64464 + 3.46257I$	0
$u = -0.507319 + 0.820349I$ $a = -1.222130 + 0.637102I$ $b = -0.580847 + 0.867836I$	$-3.86547 - 2.02217I$	$6.00000 + 0.I$
$u = -0.507319 - 0.820349I$ $a = -1.222130 - 0.637102I$ $b = -0.580847 - 0.867836I$	$-3.86547 + 2.02217I$	$6.00000 + 0.I$
$u = -0.116021 + 0.940603I$ $a = 0.784994 - 0.355068I$ $b = 0.65806 + 1.54944I$	$2.64894 - 3.41631I$	$3.10260 + 2.08330I$
$u = -0.116021 - 0.940603I$ $a = 0.784994 + 0.355068I$ $b = 0.65806 - 1.54944I$	$2.64894 + 3.41631I$	$3.10260 - 2.08330I$
$u = 0.673339 + 0.666930I$ $a = -1.09226 + 1.19514I$ $b = -0.87160 - 1.61399I$	$11.74130 + 0.35138I$	$18.3982 + 2.1314I$
$u = 0.673339 - 0.666930I$ $a = -1.09226 - 1.19514I$ $b = -0.87160 + 1.61399I$	$11.74130 - 0.35138I$	$18.3982 - 2.1314I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.814321 + 0.703037I$ $a = 0.89240 + 1.61244I$ $b = 1.70285 - 0.14650I$	$13.40880 + 1.35348I$	0
$u = -0.814321 - 0.703037I$ $a = 0.89240 - 1.61244I$ $b = 1.70285 + 0.14650I$	$13.40880 - 1.35348I$	0
$u = 0.163802 + 1.063820I$ $a = -0.618870 + 0.559588I$ $b = -1.035320 - 0.100786I$	$-2.41601 + 2.16254I$	0
$u = 0.163802 - 1.063820I$ $a = -0.618870 - 0.559588I$ $b = -1.035320 + 0.100786I$	$-2.41601 - 2.16254I$	0
$u = 0.082091 + 1.074760I$ $a = 0.393708 - 1.225530I$ $b = 0.041526 - 1.307790I$	$7.12176 + 1.27412I$	0
$u = 0.082091 - 1.074760I$ $a = 0.393708 + 1.225530I$ $b = 0.041526 + 1.307790I$	$7.12176 - 1.27412I$	0
$u = -0.381326 + 0.829948I$ $a = 1.264630 - 0.364539I$ $b = 0.22348 - 1.40162I$	$-4.56914 - 1.60830I$	$11.92985 + 7.22454I$
$u = -0.381326 - 0.829948I$ $a = 1.264630 + 0.364539I$ $b = 0.22348 + 1.40162I$	$-4.56914 + 1.60830I$	$11.92985 - 7.22454I$
$u = 0.727539 + 0.822056I$ $a = -1.044260 + 0.906641I$ $b = -2.41732 - 0.54518I$	$4.49876 - 0.62881I$	0
$u = 0.727539 - 0.822056I$ $a = -1.044260 - 0.906641I$ $b = -2.41732 + 0.54518I$	$4.49876 + 0.62881I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.787450 + 0.775531I$ $a = -0.77260 - 1.30907I$ $b = -0.086400 - 1.042150I$	$8.46954 - 2.16031I$	0
$u = 0.787450 - 0.775531I$ $a = -0.77260 + 1.30907I$ $b = -0.086400 + 1.042150I$	$8.46954 + 2.16031I$	0
$u = -0.707731 + 0.849293I$ $a = -0.453970 - 1.024470I$ $b = -1.43457 + 0.83997I$	$4.40743 - 0.27804I$	0
$u = -0.707731 - 0.849293I$ $a = -0.453970 + 1.024470I$ $b = -1.43457 - 0.83997I$	$4.40743 + 0.27804I$	0
$u = -0.703670 + 0.875856I$ $a = 0.974104 + 0.503213I$ $b = 2.34182 - 0.65068I$	$4.32813 - 5.13090I$	0
$u = -0.703670 - 0.875856I$ $a = 0.974104 - 0.503213I$ $b = 2.34182 + 0.65068I$	$4.32813 + 5.13090I$	0
$u = 0.909432 + 0.660037I$ $a = 1.199680 - 0.671979I$ $b = 1.87323 + 0.59826I$	$5.55068 - 0.89067I$	0
$u = 0.909432 - 0.660037I$ $a = 1.199680 + 0.671979I$ $b = 1.87323 - 0.59826I$	$5.55068 + 0.89067I$	0
$u = 0.638035 + 0.594328I$ $a = 0.489358 + 0.549201I$ $b = 0.153674 + 0.397027I$	$1.46159 + 0.94369I$	$8.05381 - 3.32759I$
$u = 0.638035 - 0.594328I$ $a = 0.489358 - 0.549201I$ $b = 0.153674 - 0.397027I$	$1.46159 - 0.94369I$	$8.05381 + 3.32759I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.292414 + 1.099760I$ $a = -0.045977 + 0.161008I$ $b = -0.183182 - 0.301441I$	$-3.74250 - 0.35528I$	0
$u = -0.292414 - 1.099760I$ $a = -0.045977 - 0.161008I$ $b = -0.183182 + 0.301441I$	$-3.74250 + 0.35528I$	0
$u = 0.711303 + 0.912423I$ $a = 0.868327 - 1.090420I$ $b = 2.09993 + 0.93166I$	$4.21886 + 6.12406I$	0
$u = 0.711303 - 0.912423I$ $a = 0.868327 + 1.090420I$ $b = 2.09993 - 0.93166I$	$4.21886 - 6.12406I$	0
$u = 0.594374 + 1.009220I$ $a = 0.509259 + 0.475060I$ $b = 0.236822 + 0.688574I$	$0.20929 + 3.90599I$	0
$u = 0.594374 - 1.009220I$ $a = 0.509259 - 0.475060I$ $b = 0.236822 - 0.688574I$	$0.20929 - 3.90599I$	0
$u = 0.034956 + 0.821119I$ $a = -0.41604 - 1.41541I$ $b = -0.161306 + 0.517047I$	$0.25599 - 2.44516I$	$3.51232 + 3.05197I$
$u = 0.034956 - 0.821119I$ $a = -0.41604 + 1.41541I$ $b = -0.161306 - 0.517047I$	$0.25599 + 2.44516I$	$3.51232 - 3.05197I$
$u = -1.013690 + 0.601362I$ $a = 0.99520 + 1.11698I$ $b = 1.73415 - 0.41392I$	$15.2060 + 9.6384I$	0
$u = -1.013690 - 0.601362I$ $a = 0.99520 - 1.11698I$ $b = 1.73415 + 0.41392I$	$15.2060 - 9.6384I$	0



Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.677870 + 0.977881I$ $a = 0.213548 - 0.199030I$ $b = 0.580098 + 1.130410I$	$5.90968 - 1.84580I$	0
$u = -0.677870 - 0.977881I$ $a = 0.213548 + 0.199030I$ $b = 0.580098 - 1.130410I$	$5.90968 + 1.84580I$	0
$u = 0.655258 + 1.004640I$ $a = 0.723304 - 0.915460I$ $b = 2.78885 - 0.55758I$	$10.71060 + 4.84302I$	0
$u = 0.655258 - 1.004640I$ $a = 0.723304 + 0.915460I$ $b = 2.78885 + 0.55758I$	$10.71060 - 4.84302I$	0
$u = 0.738710 + 0.963164I$ $a = -1.19204 - 0.78105I$ $b = -0.675198 - 1.198490I$	$7.89130 + 7.92115I$	0
$u = 0.738710 - 0.963164I$ $a = -1.19204 + 0.78105I$ $b = -0.675198 + 1.198490I$	$7.89130 - 7.92115I$	0
$u = 1.144690 + 0.425981I$ $a = -1.218740 + 0.443843I$ $b = -1.52526 - 0.51644I$	$13.72910 + 2.93341I$	0
$u = 1.144690 - 0.425981I$ $a = -1.218740 - 0.443843I$ $b = -1.52526 + 0.51644I$	$13.72910 - 2.93341I$	0
$u = -0.550235 + 1.099390I$ $a = -0.0754485 + 0.0197779I$ $b = 0.160032 - 0.367219I$	$-1.98390 - 7.01272I$	0
$u = -0.550235 - 1.099390I$ $a = -0.0754485 - 0.0197779I$ $b = 0.160032 + 0.367219I$	$-1.98390 + 7.01272I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.731363 + 1.014090I$ $a = -1.37318 - 0.69630I$ $b = -2.48364 + 0.63785I$	$12.4616 - 7.1678I$	0
$u = -0.731363 - 1.014090I$ $a = -1.37318 + 0.69630I$ $b = -2.48364 - 0.63785I$	$12.4616 + 7.1678I$	0
$u = -0.697806 + 1.047480I$ $a = 0.861122 + 0.565843I$ $b = 2.63010 - 0.99051I$	$3.25158 - 8.71682I$	0
$u = -0.697806 - 1.047480I$ $a = 0.861122 - 0.565843I$ $b = 2.63010 + 0.99051I$	$3.25158 + 8.71682I$	0
$u = -0.655934 + 0.321949I$ $a = 0.195232 + 0.043457I$ $b = -0.292662 + 0.217665I$	$0.19630 + 2.31331I$	$2.50410 - 3.87759I$
$u = -0.655934 - 0.321949I$ $a = 0.195232 - 0.043457I$ $b = -0.292662 - 0.217665I$	$0.19630 - 2.31331I$	$2.50410 + 3.87759I$
$u = 0.764755 + 1.056800I$ $a = -0.768111 + 0.967366I$ $b = -2.03014 - 0.43609I$	$4.34565 + 7.06034I$	0
$u = 0.764755 - 1.056800I$ $a = -0.768111 - 0.967366I$ $b = -2.03014 + 0.43609I$	$4.34565 - 7.06034I$	0
$u = -0.078514 + 0.637068I$ $a = -0.140949 + 1.209800I$ $b = -0.473595 + 1.195070I$	$0.91968 + 2.40413I$	$-0.54237 - 2.15079I$
$u = -0.078514 - 0.637068I$ $a = -0.140949 - 1.209800I$ $b = -0.473595 - 1.195070I$	$0.91968 - 2.40413I$	$-0.54237 + 2.15079I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.764358 + 1.130520I$ $a = -1.077160 - 0.723013I$ $b = -2.58282 + 0.58816I$	$13.5431 - 16.0927I$	0
$u = -0.764358 - 1.130520I$ $a = -1.077160 + 0.723013I$ $b = -2.58282 - 0.58816I$	$13.5431 + 16.0927I$	0
$u = -0.027747 + 1.400220I$ $a = -0.174463 + 0.765705I$ $b = -0.608195 - 0.323463I$	$-2.16290 + 0.96975I$	0
$u = -0.027747 - 1.400220I$ $a = -0.174463 - 0.765705I$ $b = -0.608195 + 0.323463I$	$-2.16290 - 0.96975I$	0
$u = 0.157578 + 1.394680I$ $a = 0.323172 - 0.990570I$ $b = 0.505882 - 0.267746I$	$6.98353 + 7.23116I$	0
$u = 0.157578 - 1.394680I$ $a = 0.323172 + 0.990570I$ $b = 0.505882 + 0.267746I$	$6.98353 - 7.23116I$	0
$u = 0.77726 + 1.28992I$ $a = 0.610495 - 0.781522I$ $b = 1.87938 + 0.13816I$	$11.07580 + 3.96205I$	0
$u = 0.77726 - 1.28992I$ $a = 0.610495 + 0.781522I$ $b = 1.87938 - 0.13816I$	$11.07580 - 3.96205I$	0
$u = -0.203804 + 0.401097I$ $a = 0.29924 - 1.98542I$ $b = 0.28052 + 2.03618I$	$4.74098 + 2.25423I$	$11.54945 - 5.18126I$
$u = -0.203804 - 0.401097I$ $a = 0.29924 + 1.98542I$ $b = 0.28052 - 2.03618I$	$4.74098 - 2.25423I$	$11.54945 + 5.18126I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.444431$ $a = 1.32156$ $b = 0.457135$	0.813147	12.3290
$u = 0.292517$ $a = -5.77870$ $b = 0.220364$	10.8708	3.55680

$$\text{II. } I_2^u = \langle 58306u^{29} - 92181u^{28} + \dots + 145157b - 132553, 2.14 \times 10^5 u^{29} - 5.88 \times 10^4 u^{28} + \dots + 1.45 \times 10^5 a - 3.15 \times 10^5, u^{30} + 8u^{28} + \dots - 2u + 1 \rangle$$

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -1.47238u^{29} + 0.404989u^{28} + \dots - 12.9692u + 2.17330 \\ -0.401675u^{29} + 0.635043u^{28} + \dots - 6.12894u + 0.913170 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 2.01653u^{29} - 0.240560u^{28} + \dots + 10.3514u - 0.616808 \\ 0.712808u^{29} + 0.388531u^{28} + \dots + 1.99596u + 0.773955 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 2.55462u^{29} + 0.167591u^{28} + \dots + 14.9088u - 1.00973 \\ 0.174852u^{29} + 0.258892u^{28} + \dots + 1.99550u + 0.236165 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1.70447u^{29} - 0.769353u^{28} + \dots + 14.5271u - 5.00674 \\ 0.230351u^{29} - 1.65192u^{28} + \dots + 5.14174u - 2.38759 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 2.31155u^{29} - 0.307440u^{28} + \dots + 13.6258u - 0.778295 \\ 0.377440u^{29} + 0.00674442u^{28} + \dots + 0.00549750u + 0.942635 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1.03500u^{29} + 1.30748u^{28} + \dots - 3.08951u + 2.26109 \\ 0.186770u^{29} - 0.118678u^{28} + \dots + 0.707145u - 0.350117 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -2.01033u^{29} + 0.275350u^{28} + \dots - 12.9696u + 1.63551 \\ -0.889272u^{29} + 0.343531u^{28} + \dots - 5.85073u + 0.505019 \end{pmatrix}$$

(ii) Obstruction class = 1

$$\text{(iii) Cusp Shapes} = \frac{1400610}{145157} u^{29} + \frac{939828}{145157} u^{28} + \dots + \frac{3223212}{145157} u + \frac{2462379}{145157}$$

(iv)  $u$ -Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{30} - 16u^{29} + \dots - 18u + 1$
$c_2$	$u^{30} + 8u^{28} + \dots - 2u + 1$
$c_3$	$u^{30} - 11u^{29} + \dots - 3u + 1$
$c_4$	$u^{30} + u^{29} + \dots + 25u + 13$
$c_5$	$u^{30} + 3u^{29} + \dots - 104u + 16$
$c_6$	$u^{30} - u^{29} + \dots - 84u + 8$
$c_7$	$u^{30} - 2u^{29} + \dots - 2u + 1$
$c_8$	$u^{30} + 8u^{28} + \dots + 2u + 1$
$c_9$	$u^{30} - 8u^{28} + \dots - 4u + 1$
$c_{10}$	$u^{30} + 2u^{29} + \dots + 2u + 1$
$c_{11}$	$u^{30} - 14u^{29} + \dots - 599u + 77$
$c_{12}$	$u^{30} - 5u^{29} + \dots - u + 1$





(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{30} + 8y^{29} + \dots - 54y + 1$
$c_2, c_8$	$y^{30} + 16y^{29} + \dots + 18y + 1$
$c_3$	$y^{30} - 5y^{29} + \dots - 9y + 1$
$c_4$	$y^{30} - 21y^{29} + \dots + 1533y + 169$
$c_5$	$y^{30} - 23y^{29} + \dots - 3520y + 256$
$c_6$	$y^{30} - y^{29} + \dots - 1104y + 64$
$c_7, c_{10}$	$y^{30} - 16y^{29} + \dots - 18y + 1$
$c_9$	$y^{30} - 16y^{29} + \dots + 10y + 1$
$c_{11}$	$y^{30} - 38y^{29} + \dots - 117791y + 5929$
$c_{12}$	$y^{30} - 13y^{29} + \dots + 17y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.783418 + 0.632894I$ $a = -0.810991 - 1.018060I$ $b = -1.83940 + 0.78866I$	$3.40622 + 3.06203I$	$7.45974 - 2.51576I$
$u = -0.783418 - 0.632894I$ $a = -0.810991 + 1.018060I$ $b = -1.83940 - 0.78866I$	$3.40622 - 3.06203I$	$7.45974 + 2.51576I$
$u = 0.619760 + 0.865626I$ $a = 1.16399 + 0.94071I$ $b = 0.309140 + 1.239140I$	$-3.19194 + 2.43189I$	$12.01531 - 5.52437I$
$u = 0.619760 - 0.865626I$ $a = 1.16399 - 0.94071I$ $b = 0.309140 - 1.239140I$	$-3.19194 - 2.43189I$	$12.01531 + 5.52437I$
$u = -0.368581 + 1.000170I$ $a = -0.426345 - 0.302191I$ $b = 0.67189 + 1.63285I$	$3.60668 - 4.39482I$	$9.00853 + 6.46321I$
$u = -0.368581 - 1.000170I$ $a = -0.426345 + 0.302191I$ $b = 0.67189 - 1.63285I$	$3.60668 + 4.39482I$	$9.00853 - 6.46321I$
$u = 0.332552 + 0.864602I$ $a = -1.206910 - 0.245260I$ $b = -0.413045 - 1.160100I$	$-4.89037 + 1.43366I$	$-8.45611 + 3.24752I$
$u = 0.332552 - 0.864602I$ $a = -1.206910 + 0.245260I$ $b = -0.413045 + 1.160100I$	$-4.89037 - 1.43366I$	$-8.45611 - 3.24752I$
$u = -0.684283 + 0.854673I$ $a = 0.818321 + 0.115887I$ $b = 2.27305 + 0.07664I$	$6.45076 - 4.59120I$	$11.56923 + 7.10771I$
$u = -0.684283 - 0.854673I$ $a = 0.818321 - 0.115887I$ $b = 2.27305 - 0.07664I$	$6.45076 + 4.59120I$	$11.56923 - 7.10771I$

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.335307 + 0.788308I$ $a = -0.308397 + 0.642481I$ $b = 0.30926 + 2.50864I$	$4.40509 + 1.42170I$	$7.66101 + 2.26727I$
$u = -0.335307 - 0.788308I$ $a = -0.308397 - 0.642481I$ $b = 0.30926 - 2.50864I$	$4.40509 - 1.42170I$	$7.66101 - 2.26727I$
$u = -0.725614 + 0.892152I$ $a = -0.091508 - 0.819126I$ $b = -0.476611 + 1.081330I$	$6.34146 - 0.80394I$	$13.14765 - 1.03633I$
$u = -0.725614 - 0.892152I$ $a = -0.091508 + 0.819126I$ $b = -0.476611 - 1.081330I$	$6.34146 + 0.80394I$	$13.14765 + 1.03633I$
$u = 0.582986 + 0.610428I$ $a = -1.23889 + 1.49928I$ $b = -0.75129 - 1.21355I$	$11.28510 + 0.73508I$	$7.51796 - 7.30910I$
$u = 0.582986 - 0.610428I$ $a = -1.23889 - 1.49928I$ $b = -0.75129 + 1.21355I$	$11.28510 - 0.73508I$	$7.51796 + 7.30910I$
$u = 0.255399 + 1.222230I$ $a = -0.324792 + 0.567201I$ $b = -0.847986 + 0.110219I$	$-3.30623 + 1.15332I$	$4.33144 - 1.27674I$
$u = 0.255399 - 1.222230I$ $a = -0.324792 - 0.567201I$ $b = -0.847986 - 0.110219I$	$-3.30623 - 1.15332I$	$4.33144 + 1.27674I$
$u = 0.540675 + 1.125620I$ $a = -0.222231 + 0.444877I$ $b = -0.534770 + 0.403381I$	$-1.49594 + 7.00148I$	$12.8281 - 7.0248I$
$u = 0.540675 - 1.125620I$ $a = -0.222231 - 0.444877I$ $b = -0.534770 - 0.403381I$	$-1.49594 - 7.00148I$	$12.8281 + 7.0248I$

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.700718 + 1.037000I$ $a = 0.874088 + 0.682487I$ $b = 2.43000 - 0.94490I$	$2.19546 - 8.69208I$	$4.75207 + 7.00700I$
$u = -0.700718 - 1.037000I$ $a = 0.874088 - 0.682487I$ $b = 2.43000 + 0.94490I$	$2.19546 + 8.69208I$	$4.75207 - 7.00700I$
$u = 0.711976 + 0.189161I$ $a = 1.061860 - 0.269522I$ $b = 0.438542 - 0.183348I$	$1.04863 - 2.30351I$	$12.72741 + 3.19180I$
$u = 0.711976 - 0.189161I$ $a = 1.061860 + 0.269522I$ $b = 0.438542 + 0.183348I$	$1.04863 + 2.30351I$	$12.72741 - 3.19180I$
$u = 0.640934 + 1.118050I$ $a = 0.700059 - 0.901785I$ $b = 2.11090 - 0.28974I$	$9.61448 + 4.20198I$	$7.63729 - 2.59179I$
$u = 0.640934 - 1.118050I$ $a = 0.700059 + 0.901785I$ $b = 2.11090 + 0.28974I$	$9.61448 - 4.20198I$	$7.63729 + 2.59179I$
$u = -0.127172 + 1.326790I$ $a = -0.146586 + 0.798852I$ $b = -0.384493 - 0.315318I$	$-2.41141 + 1.33974I$	$3.46635 - 9.18297I$
$u = -0.127172 - 1.326790I$ $a = -0.146586 - 0.798852I$ $b = -0.384493 + 0.315318I$	$-2.41141 - 1.33974I$	$3.46635 + 9.18297I$
$u = 0.040810 + 0.418157I$ $a = -0.34166 - 2.28175I$ $b = -0.295186 - 0.743488I$	$1.48560 - 2.52463I$	$14.3340 + 4.6539I$
$u = 0.040810 - 0.418157I$ $a = -0.34166 + 2.28175I$ $b = -0.295186 + 0.743488I$	$1.48560 + 2.52463I$	$14.3340 - 4.6539I$

### III. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$(u^{30} - 16u^{29} + \dots - 18u + 1)(u^{72} + 29u^{71} + \dots + 1483u + 169)$
$c_2$	$(u^{30} + 8u^{28} + \dots - 2u + 1)(u^{72} + u^{71} + \dots - 5u + 13)$
$c_3$	$(u^{30} - 11u^{29} + \dots - 3u + 1)(u^{72} - 8u^{71} + \dots - 1454u + 103)$
$c_4$	$(u^{30} + u^{29} + \dots + 25u + 13)(u^{72} - 2u^{71} + \dots + 2563738u + 372821)$
$c_5$	$(u^{30} + 3u^{29} + \dots - 104u + 16)$ $\cdot (u^{72} - 6u^{71} + \dots - 62302304u + 12968512)$
$c_6$	$(u^{30} - u^{29} + \dots - 84u + 8)(u^{72} + 2u^{71} + \dots - 81136u + 4448)$
$c_7$	$(u^{30} - 2u^{29} + \dots - 2u + 1)(u^{72} - 3u^{71} + \dots - 11u - 1)$
$c_8$	$(u^{30} + 8u^{28} + \dots + 2u + 1)(u^{72} + u^{71} + \dots - 5u + 13)$
$c_9$	$(u^{30} - 8u^{28} + \dots - 4u + 1)(u^{72} + u^{71} + \dots - 77411u - 34673)$
$c_{10}$	$(u^{30} + 2u^{29} + \dots + 2u + 1)(u^{72} - 3u^{71} + \dots - 11u - 1)$
$c_{11}$	$(u^{30} - 14u^{29} + \dots - 599u + 77)(u^{72} + 7u^{71} + \dots - 7376u - 2363)$
$c_{12}$	$(u^{30} - 5u^{29} + \dots - u + 1)(u^{72} + 10u^{71} + \dots - 582696u - 825103)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
$c_1$	$(y^{30} + 8y^{29} + \dots - 54y + 1)(y^{72} + 41y^{71} + \dots - 4031249y + 28561)$
$c_2, c_8$	$(y^{30} + 16y^{29} + \dots + 18y + 1)(y^{72} + 29y^{71} + \dots + 1483y + 169)$
$c_3$	$(y^{30} - 5y^{29} + \dots - 9y + 1)(y^{72} + 8y^{71} + \dots + 86788y + 10609)$
$c_4$	$(y^{30} - 21y^{29} + \dots + 1533y + 169)$ $\cdot (y^{72} - 108y^{71} + \dots - 1786672638490y + 138995498041)$
$c_5$	$(y^{30} - 23y^{29} + \dots - 3520y + 256)$ $\cdot (y^{72} - 78y^{71} + \dots + 6347781005638656y + 168182303494144)$
$c_6$	$(y^{30} - y^{29} + \dots - 1104y + 64)$ $\cdot (y^{72} + 24y^{71} + \dots - 1766542592y + 19784704)$
$c_7, c_{10}$	$(y^{30} - 16y^{29} + \dots - 18y + 1)(y^{72} - 63y^{71} + \dots + 91y + 1)$
$c_9$	$(y^{30} - 16y^{29} + \dots + 10y + 1)$ $\cdot (y^{72} - 99y^{71} + \dots - 7903121y + 1202216929)$
$c_{11}$	$(y^{30} - 38y^{29} + \dots - 117791y + 5929)$ $\cdot (y^{72} - 105y^{71} + \dots - 197872558y + 5583769)$
$c_{12}$	$(y^{30} - 13y^{29} + \dots + 17y + 1)$ $\cdot (y^{72} - 56y^{71} + \dots - 78126375735346y + 680794960609)$