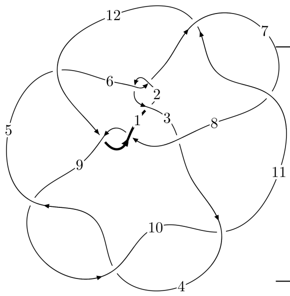
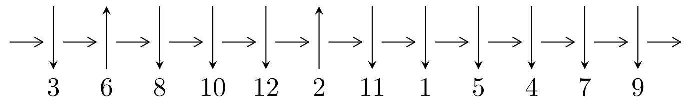
$12a_{0312}$ $(K12a_{0312})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I^u_1 = \langle 6.51285\times10^{52}u^{38} + 4.25612\times10^{53}u^{37} + \cdots + 3.10340\times10^{55}b - 6.72847\times10^{55},$$
$$5.07566\times10^{53}u^{38} + 1.21366\times10^{54}u^{37} + \cdots + 8.27573\times10^{55}a + 1.83729\times10^{55},\ u^{39} + 3u^{38} + \cdots - 96u -$$
$$I^u_2 = \langle -u^{25}a - u^{25} + \cdots + 6a + 43,\ -6u^{25}a - 35u^{25} + \cdots + 15a - 67,\ u^{26} - u^{25} + \cdots + u + 1\rangle$$
$$I^u_3 = \langle u^5 + b + u,\ -8u^5 + 4u^4 + u^3 + 3u^2 + 7a - 11u + 9,\ u^6 + u^4 + 2u^2 + 1\rangle$$
$$I^u_4 = \langle b + 1,\ 8a^2 - 2au - 8a + u + 1,\ u^2 + 2\rangle$$

$$I^v_1 = \langle a,\ b - 1,\ 4v^2 + 2v + 1\rangle$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 103 representations.

[1] The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

[2] All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I. $I_1^u =$
$\langle 6.51\times10^{52}u^{38}+4.26\times10^{53}u^{37}+\cdots+3.10\times10^{55}b-6.73\times10^{55},\ 5.08\times10^{53}u^{38}+1.21\times10^{54}u^{37}+\cdots+8.28\times10^{55}a+1.84\times10^{55},\ u^{39}+3u^{38}+\cdots-96u-32\rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.00613319u^{38} - 0.0146653u^{37} + \cdots - 1.67950u - 0.222009 \\ -0.00209862u^{38} - 0.0137144u^{37} + \cdots + 4.11518u + 2.16810 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.00371852u^{38} - 0.00662758u^{37} + \cdots - 2.29660u - 0.339906 \\ 0.00563183u^{38} + 0.0246725u^{37} + \cdots - 4.41659u - 2.14110 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.00147024u^{38} + 0.00779912u^{37} + \cdots - 0.146149u - 0.385271 \\ 0.0147761u^{38} + 0.0398452u^{37} + \cdots - 1.72908u + 0.367860 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.00248223u^{38} + 0.00407192u^{37} + \cdots - 5.63245u - 2.27061 \\ 0.00425275u^{38} + 0.0171497u^{37} + \cdots - 2.92659u - 1.68001 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.00823181u^{38} - 0.0283797u^{37} + \cdots + 2.43568u + 1.94609 \\ -0.00209862u^{38} - 0.0137144u^{37} + \cdots + 4.11518u + 2.16810 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0124595u^{38} + 0.0311845u^{37} + \cdots - 1.95527u + 0.644702 \\ 0.0123050u^{38} + 0.0359587u^{37} + \cdots - 2.29733u + 0.0612259 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.000124004u^{38} - 0.00169964u^{37} + \cdots + 0.337679u + 0.864298 \\ 0.0145344u^{38} + 0.0352525u^{37} + \cdots + 0.739324u + 1.46196 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.240650u^{38} + 0.650895u^{37} + \cdots - 36.8708u + 0.708138$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{39}+18u^{38}+\cdots+4081u-576$
c_2, c_6	$u^{39}-2u^{38}+\cdots-7u+24$
c_3, c_5	$64(64u^{39}-32u^{38}+\cdots+42u+7)$
c_4, c_9, c_{10}	$u^{39}-3u^{38}+\cdots-96u+32$
c_7, c_8, c_{11} c_{12}	$u^{39}-2u^{38}+\cdots-34u+3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{39}+10y^{38}+\cdots+63273697y-331776$
c_2, c_6	$y^{39}+18y^{38}+\cdots+4081y-576$
c_3, c_5	$4096(4096y^{39}+134144y^{38}+\cdots+294y-49)$
c_4, c_9, c_{10}	$y^{39}+39y^{38}+\cdots-17408y-1024$
c_7, c_8, c_{11} c_{12}	$y^{39}+28y^{38}+\cdots-32y-9$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.284805 + 0.928305I$ $a = -0.13683 - 1.42324I$ $b = -0.452196 + 0.700666I$	$-0.54297 + 5.03875I$	$-8.25655 - 9.28786I$
$u = -0.284805 - 0.928305I$ $a = -0.13683 + 1.42324I$ $b = -0.452196 - 0.700666I$	$-0.54297 - 5.03875I$	$-8.25655 + 9.28786I$
$u = 0.484749 + 0.961063I$ $a = 0.477652 - 0.888292I$ $b = -0.265156 + 0.743897I$	$-0.68459 - 2.11963I$	$-9.46610 - 1.15998I$
$u = 0.484749 - 0.961063I$ $a = 0.477652 + 0.888292I$ $b = -0.265156 - 0.743897I$	$-0.68459 + 2.11963I$	$-9.46610 + 1.15998I$
$u = -0.850562 + 0.700092I$ $a = -0.913679 - 0.827942I$ $b = -0.43681 + 1.39469I$	$7.9219 + 13.0672I$	$-2.83281 - 8.70370I$
$u = -0.850562 - 0.700092I$ $a = -0.913679 + 0.827942I$ $b = -0.43681 - 1.39469I$	$7.9219 - 13.0672I$	$-2.83281 + 8.70370I$
$u = 0.021011 + 1.113620I$ $a = 0.113149 + 0.982543I$ $b = -0.417378 - 0.585720I$	$2.61415 - 1.46386I$	$-3.75938 + 4.77609I$
$u = 0.021011 - 1.113620I$ $a = 0.113149 - 0.982543I$ $b = -0.417378 + 0.585720I$	$2.61415 + 1.46386I$	$-3.75938 - 4.77609I$
$u = -1.024080 + 0.504017I$ $a = -0.340192 - 0.350015I$ $b = 0.242441 + 1.346780I$	$7.21089 - 6.95675I$	$-1.57897 + 4.70182I$
$u = -1.024080 - 0.504017I$ $a = -0.340192 + 0.350015I$ $b = 0.242441 - 1.346780I$	$7.21089 + 6.95675I$	$-1.57897 - 4.70182I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.899466 + 0.710929I$ $a = -0.806485 + 0.746074I$ $b = -0.31980 - 1.40480I$	$9.60981 - 6.62935I$	$-0.44294 + 4.43297I$
$u = 0.899466 - 0.710929I$ $a = -0.806485 - 0.746074I$ $b = -0.31980 + 1.40480I$	$9.60981 + 6.62935I$	$-0.44294 - 4.43297I$
$u = 1.046090 + 0.585321I$ $a = -0.447106 + 0.457880I$ $b = 0.097717 - 1.375450I$	$9.08947 + 0.21395I$	$1.186596 + 0.413950I$
$u = 1.046090 - 0.585321I$ $a = -0.447106 - 0.457880I$ $b = 0.097717 + 1.375450I$	$9.08947 - 0.21395I$	$1.186596 - 0.413950I$
$u = -1.088540 + 0.802120I$ $a = -0.469791 - 0.757971I$ $b = -0.104038 + 1.220040I$	$1.35178 + 3.70831I$	$0. - 5.50700I$
$u = -1.088540 - 0.802120I$ $a = -0.469791 + 0.757971I$ $b = -0.104038 - 1.220040I$	$1.35178 - 3.70831I$	$0. + 5.50700I$
$u = 0.024809 + 1.389690I$ $a = -0.682113 + 0.285569I$ $b = -0.128700 - 0.137181I$	$4.95731 - 2.14817I$	$0. + 4.01911I$
$u = 0.024809 - 1.389690I$ $a = -0.682113 - 0.285569I$ $b = -0.128700 + 0.137181I$	$4.95731 + 2.14817I$	$0. - 4.01911I$
$u = -0.087825 + 1.410570I$ $a = 0.565414 + 0.372983I$ $b = -0.993287 - 0.445251I$	$2.42149 - 0.42416I$	$-8.00000 + 0.I$
$u = -0.087825 - 1.410570I$ $a = 0.565414 - 0.372983I$ $b = -0.993287 + 0.445251I$	$2.42149 + 0.42416I$	$-8.00000 + 0.I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.475767+0.181696I$ $a=\ \ 0.383979-0.039197I$ $b=\ \ 0.773750+0.480261I$	$-2.68424-2.19929I$	$-15.6702+1.3086I$
$u=-0.475767-0.181696I$ $a=\ \ 0.383979+0.039197I$ $b=\ \ 0.773750-0.480261I$	$-2.68424+2.19929I$	$-15.6702-1.3086I$
$u=-0.01764+1.52619I$ $a=\ \ 0.955880+0.065318I$ $b=-1.64994-0.11450I$	$5.17213+2.58745I$	0
$u=-0.01764-1.52619I$ $a=\ \ 0.955880-0.065318I$ $b=-1.64994+0.11450I$	$5.17213-2.58745I$	0
$u=\ \ 0.071403+0.441330I$ $a=\ \ 1.51732-0.80229I$ $b=-0.338553+0.229132I$	$-0.54939-1.65860I$	$-4.21380+1.79570I$
$u=\ \ 0.071403-0.441330I$ $a=\ \ 1.51732+0.80229I$ $b=-0.338553-0.229132I$	$-0.54939+1.65860I$	$-4.21380-1.79570I$
$u=-0.094781+0.360218I$ $a=\ \ 0.544712+0.036408I$ $b=\ \ 1.215470+0.103619I$	$-1.37228+2.24874I$	$4.40609-10.02980I$
$u=-0.094781-0.360218I$ $a=\ \ 0.544712-0.036408I$ $b=\ \ 1.215470-0.103619I$	$-1.37228-2.24874I$	$4.40609+10.02980I$
$u=\ \ 0.372322$ $a=\ \ 0.597491$ $b=\ \ 0.434285$	-0.672199	-14.5900
$u=-0.27857+1.61370I$ $a=\ \ 0.62986+1.83200I$ $b=\ \ 0.56880-1.49325I$	$15.5418+17.2782I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.27857 - 1.61370I$ $a = 0.62986 - 1.83200I$ $b = 0.56880 + 1.49325I$	$15.5418 - 17.2782I$	0
$u = 0.28827 + 1.62593I$ $a = 0.62219 - 1.76672I$ $b = 0.48592 + 1.51538I$	$17.3108 - 11.0467I$	0
$u = 0.28827 - 1.62593I$ $a = 0.62219 + 1.76672I$ $b = 0.48592 - 1.51538I$	$17.3108 + 11.0467I$	0
$u = -0.27452 + 1.67561I$ $a = 0.45265 + 1.68686I$ $b = 0.351061 - 1.346420I$	$9.74081 + 8.64375I$	0
$u = -0.27452 - 1.67561I$ $a = 0.45265 - 1.68686I$ $b = 0.351061 + 1.346420I$	$9.74081 - 8.64375I$	0
$u = 0.34143 + 1.66879I$ $a = 0.56308 - 1.50519I$ $b = 0.14914 + 1.47169I$	$16.5682 - 5.0648I$	0
$u = 0.34143 - 1.66879I$ $a = 0.56308 + 1.50519I$ $b = 0.14914 - 1.47169I$	$16.5682 + 5.0648I$	0
$u = -0.38631 + 1.66978I$ $a = 0.54657 + 1.37900I$ $b = 0.00441 - 1.41697I$	$14.2718 - 1.5060I$	0
$u = -0.38631 - 1.66978I$ $a = 0.54657 - 1.37900I$ $b = 0.00441 + 1.41697I$	$14.2718 + 1.5060I$	0

II. $I_2^u = \langle -u^{25}a - u^{25} + \cdots + 6a + 43,\ -6u^{25}a - 35u^{25} + \cdots + 15a - 67,\ u^{26} - u^{25} + \cdots + u + 1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} a \\ 0.0270270au^{25} + 0.0270270u^{25} + \cdots - 0.162162a - 1.16216 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.0270270au^{25} + 1.36036u^{25} + \cdots - 1.16216a - 0.495495 \\ 0.0270270au^{25} + 0.0270270u^{25} + \cdots - 0.162162a + 0.837838 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.990991au^{25} - 0.453453u^{25} + \cdots + 1.38739a + 2.16517 \\ 0.486486au^{25} - 0.846847u^{25} + \cdots + 0.0810811a - 0.585586 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.0270270au^{25} + 1.36036u^{25} + \cdots - 1.16216a - 1.49550 \\ 1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0.0270270au^{25} + 0.0270270u^{25} + \cdots + 0.837838a - 1.16216 \\ 0.0270270au^{25} + 0.0270270u^{25} + \cdots - 0.162162a - 1.16216 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.846847au^{25} - 1.04204u^{25} + \cdots + 0.585586a + 1.14114 \\ -0.324324au^{25} - 0.990991u^{25} + \cdots - 0.0540541a - 1.38739 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.774775au^{25} - 0.330330u^{25} + \cdots + 2.31532a - 1.46246 \\ -0.135135au^{25} - 0.801802u^{25} + \cdots + 0.810811a - 1.52252 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^{24} - 4u^{23} + 56u^{22} - 52u^{21} + 332u^{20} - 284u^{19} + 1080u^{18} - 844u^{17} + 2096u^{16} - 1484u^{15} + 2508u^{14} - 1596u^{13} + 1940u^{12} - 1096u^{11} + 1112u^{10} - 540u^9 + 504u^8 - 212u^7 + 132u^6 - 60u^5 + 48u^4 - 12u^3 + 16u^2 - 12u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{26} + 9u^{25} + \cdots + 5u + 1)^2$
c_2, c_6	$(u^{26} - u^{25} + \cdots - u + 1)^2$
c_3, c_5	$9(9u^{52} - 87u^{51} + \cdots - 3.27654 \times 10^7 u + 6443297)$
c_4, c_9, c_{10}	$(u^{26} + u^{25} + \cdots - u + 1)^2$
c_7, c_8, c_{11} c_{12}	$u^{52} + 5u^{51} + \cdots + 548u + 125$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{26} + 17y^{25} + \cdots + 29y + 1)^2$
c_2, c_6	$(y^{26} + 9y^{25} + \cdots + 5y + 1)^2$
c_3, c_5	81 $\cdot (81y^{52} + 2835y^{51} + \cdots + 516271175779380y + 41516076230209)$
c_4, c_9, c_{10}	$(y^{26} + 29y^{25} + \cdots + 5y + 1)^2$
c_7, c_8, c_{11} c_{12}	$y^{52} + 39y^{51} + \cdots + 151696y + 15625$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.557205 + 0.605601I$ $a = 0.908515 - 0.786612I$ $b = 0.44461 + 1.37915I$	$3.14131 - 7.92757I$	$-5.52051 + 8.33110I$
$u = 0.557205 + 0.605601I$ $a = -0.546617 + 0.149415I$ $b = -1.009470 - 0.105339I$	$3.14131 - 7.92757I$	$-5.52051 + 8.33110I$
$u = 0.557205 - 0.605601I$ $a = 0.908515 + 0.786612I$ $b = 0.44461 - 1.37915I$	$3.14131 + 7.92757I$	$-5.52051 - 8.33110I$
$u = 0.557205 - 0.605601I$ $a = -0.546617 - 0.149415I$ $b = -1.009470 + 0.105339I$	$3.14131 + 7.92757I$	$-5.52051 - 8.33110I$
$u = -0.063283 + 0.808616I$ $a = -0.774190 + 0.526907I$ $b = -0.406074 - 1.296320I$	$7.01322 + 2.64715I$	$0.54618 - 3.67555I$
$u = -0.063283 + 0.808616I$ $a = -1.113660 - 0.448597I$ $b = -0.481799 + 1.224650I$	$7.01322 + 2.64715I$	$0.54618 - 3.67555I$
$u = -0.063283 - 0.808616I$ $a = -0.774190 - 0.526907I$ $b = -0.406074 + 1.296320I$	$7.01322 - 2.64715I$	$0.54618 + 3.67555I$
$u = -0.063283 - 0.808616I$ $a = -1.113660 + 0.448597I$ $b = -0.481799 - 1.224650I$	$7.01322 - 2.64715I$	$0.54618 + 3.67555I$
$u = -0.506771 + 0.602442I$ $a = 0.845502 + 0.826551I$ $b = 0.283417 - 1.369520I$	$4.26499 + 2.50037I$	$-3.37218 - 3.68649I$
$u = -0.506771 + 0.602442I$ $a = -0.706203 - 0.001643I$ $b = -0.857226 + 0.277909I$	$4.26499 + 2.50037I$	$-3.37218 - 3.68649I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.506771-0.602442I$ $a=\ \ 0.845502-0.826551I$ $b=\ \ 0.283417+1.369520I$	$4.26499-2.50037I$	$-3.37218+3.68649I$
$u=-0.506771-0.602442I$ $a=-0.706203+0.001643I$ $b=-0.857226-0.277909I$	$4.26499-2.50037I$	$-3.37218+3.68649I$
$u=\ \ 0.565256+0.486664I$ $a=\ \ 0.876953-0.806174I$ $b=\ \ 0.315896+0.901619I$	$-1.29717-1.94179I$	$-11.39486+3.84898I$
$u=\ \ 0.565256+0.486664I$ $a=\ \ 0.023979-0.302536I$ $b=-0.446412+0.289709I$	$-1.29717-1.94179I$	$-11.39486+3.84898I$
$u=\ \ 0.565256-0.486664I$ $a=\ \ 0.876953+0.806174I$ $b=\ \ 0.315896-0.901619I$	$-1.29717+1.94179I$	$-11.39486-3.84898I$
$u=\ \ 0.565256-0.486664I$ $a=\ \ 0.023979+0.302536I$ $b=-0.446412-0.289709I$	$-1.29717+1.94179I$	$-11.39486-3.84898I$
$u=\ \ 0.588033+0.339866I$ $a=\ \ 1.354340+0.197426I$ $b=-0.190825+1.201440I$	$2.36739+4.00629I$	$-7.77829-2.28167I$
$u=\ \ 0.588033+0.339866I$ $a=\ \ 0.52368-1.59827I$ $b=\ \ 0.544635-0.217951I$	$2.36739+4.00629I$	$-7.77829-2.28167I$
$u=\ \ 0.588033-0.339866I$ $a=\ \ 1.354340-0.197426I$ $b=-0.190825-1.201440I$	$2.36739-4.00629I$	$-7.77829+2.28167I$
$u=\ \ 0.588033-0.339866I$ $a=\ \ 0.52368+1.59827I$ $b=\ \ 0.544635+0.217951I$	$2.36739-4.00629I$	$-7.77829+2.28167I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.489623 + 0.284759I$ $a = 2.18275 + 0.11119I$ $b = -0.014701 - 1.195450I$	$3.40411 + 1.00551I$	$-6.42231 - 3.62739I$
$u = -0.489623 + 0.284759I$ $a = 0.06160 + 2.26036I$ $b = 0.279398 + 0.549276I$	$3.40411 + 1.00551I$	$-6.42231 - 3.62739I$
$u = -0.489623 - 0.284759I$ $a = 2.18275 - 0.11119I$ $b = -0.014701 + 1.195450I$	$3.40411 - 1.00551I$	$-6.42231 + 3.62739I$
$u = -0.489623 - 0.284759I$ $a = 0.06160 - 2.26036I$ $b = 0.279398 - 0.549276I$	$3.40411 - 1.00551I$	$-6.42231 + 3.62739I$
$u = 0.08778 + 1.44888I$ $a = 1.36031 + 0.96993I$ $b = 0.123022 + 0.607999I$	$7.95687 + 1.77746I$	$-4.37085 - 2.67865I$
$u = 0.08778 + 1.44888I$ $a = -1.67018 + 2.70770I$ $b = 0.003774 - 1.163280I$	$7.95687 + 1.77746I$	$-4.37085 - 2.67865I$
$u = 0.08778 - 1.44888I$ $a = 1.36031 - 0.96993I$ $b = 0.123022 - 0.607999I$	$7.95687 - 1.77746I$	$-4.37085 + 2.67865I$
$u = 0.08778 - 1.44888I$ $a = -1.67018 - 2.70770I$ $b = 0.003774 + 1.163280I$	$7.95687 - 1.77746I$	$-4.37085 + 2.67865I$
$u = -0.304550 + 0.390095I$ $a = -2.14676 + 1.48082I$ $b = -0.147408 + 0.712500I$	$3.22784 + 0.99254I$	$-5.03716 - 6.67512I$
$u = -0.304550 + 0.390095I$ $a = 1.58906 + 2.18030I$ $b = -0.024365 - 1.159480I$	$3.22784 + 0.99254I$	$-5.03716 - 6.67512I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.304550-0.390095I$ $a=-2.14676-1.48082I$ $b=-0.147408-0.712500I$	$3.22784-0.99254I$	$-5.03716+6.67512I$
$u=-0.304550-0.390095I$ $a=\ \ 1.58906-2.18030I$ $b=-0.024365+1.159480I$	$3.22784-0.99254I$	$-5.03716+6.67512I$
$u=\ \ 0.15393+1.51610I$ $a=-0.244659+0.073372I$ $b=\ \ 0.781532+0.034297I$	$5.31067-4.47678I$	$-7.30340+3.58620I$
$u=\ \ 0.15393+1.51610I$ $a=-0.51526+1.89761I$ $b=-0.374114-1.224410I$	$5.31067-4.47678I$	$-7.30340+3.58620I$
$u=\ \ 0.15393-1.51610I$ $a=-0.244659-0.073372I$ $b=\ \ 0.781532-0.034297I$	$5.31067+4.47678I$	$-7.30340-3.58620I$
$u=\ \ 0.15393-1.51610I$ $a=-0.51526-1.89761I$ $b=-0.374114+1.224410I$	$5.31067+4.47678I$	$-7.30340-3.58620I$
$u=-0.09394+1.52190I$ $a=\ \ 0.460645+0.452308I$ $b=\ \ 0.665565-0.626074I$	$9.71769+2.46970I$	$-0.41193-2.77943I$
$u=-0.09394+1.52190I$ $a=-0.45078-2.30789I$ $b=-0.038145+1.373730I$	$9.71769+2.46970I$	$-0.41193-2.77943I$
$u=-0.09394-1.52190I$ $a=\ \ 0.460645-0.452308I$ $b=\ \ 0.665565+0.626074I$	$9.71769-2.46970I$	$-0.41193+2.77943I$
$u=-0.09394-1.52190I$ $a=-0.45078+2.30789I$ $b=-0.038145-1.373730I$	$9.71769-2.46970I$	$-0.41193+2.77943I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.14965 + 1.56671I$ $a = -0.427513 + 0.464073I$ $b = 1.286740 - 0.289716I$	$11.55040 + 4.90123I$	$-0.29851 - 2.20839I$
$u = -0.14965 + 1.56671I$ $a = -0.33833 - 2.00964I$ $b = -0.45547 + 1.63285I$	$11.55040 + 4.90123I$	$-0.29851 - 2.20839I$
$u = -0.14965 - 1.56671I$ $a = -0.427513 - 0.464073I$ $b = 1.286740 + 0.289716I$	$11.55040 - 4.90123I$	$-0.29851 + 2.20839I$
$u = -0.14965 - 1.56671I$ $a = -0.33833 + 2.00964I$ $b = -0.45547 - 1.63285I$	$11.55040 - 4.90123I$	$-0.29851 + 2.20839I$
$u = 0.16684 + 1.56649I$ $a = -0.567065 - 0.388686I$ $b = 1.367540 + 0.115693I$	$10.4089 - 10.5785I$	$-2.23924 + 6.94484I$
$u = 0.16684 + 1.56649I$ $a = -0.31601 + 1.97598I$ $b = -0.60715 - 1.60654I$	$10.4089 - 10.5785I$	$-2.23924 + 6.94484I$
$u = 0.16684 - 1.56649I$ $a = -0.567065 + 0.388686I$ $b = 1.367540 - 0.115693I$	$10.4089 + 10.5785I$	$-2.23924 - 6.94484I$
$u = 0.16684 - 1.56649I$ $a = -0.31601 - 1.97598I$ $b = -0.60715 + 1.60654I$	$10.4089 + 10.5785I$	$-2.23924 - 6.94484I$
$u = -0.01123 + 1.60251I$ $a = -0.09006 + 1.65768I$ $b = 0.80517 - 1.55246I$	$15.1804 + 2.8815I$	$1.60306 - 2.87824I$
$u = -0.01123 + 1.60251I$ $a = -0.11338 - 1.79936I$ $b = 0.65186 + 1.66532I$	$15.1804 + 2.8815I$	$1.60306 - 2.87824I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.01123-1.60251I$		
$a=-0.09006-1.65768I$	$15.1804-2.8815I$	$1.60306+2.87824I$
$b=0.80517+1.55246I$		
$u=-0.01123-1.60251I$		
$a=-0.11338+1.79936I$	$15.1804-2.8815I$	$1.60306+2.87824I$
$b=0.65186-1.66532I$		

III.

$$\boldsymbol{I^u_3 = \langle u^5 + b + u,\ -8u^5 + 4u^4 + u^3 + 3u^2 + 7a - 11u + 9,\ u^6 + u^4 + 2u^2 + 1\rangle}$$

(i) Arc colorings

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

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

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

$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{8}{7}u^5 - \frac{4}{7}u^4 + \cdots + \frac{11}{7}u - \frac{9}{7} \\ -u^5 - u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -\frac{29}{49}u^4 - \frac{6}{49}u^2 + u - \frac{60}{49} \\ -\frac{4}{7}u^5 + \frac{2}{7}u^4 + \cdots - \frac{2}{7}u + \frac{1}{7} \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} \frac{1}{7}u^5 - \frac{4}{7}u^4 + \cdots + \frac{4}{7}u - \frac{9}{7} \\ -u^5 - u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -\frac{4}{7}u^5 - \frac{20}{49}u^4 + \cdots - \frac{9}{7}u - \frac{38}{49} \\ -\frac{3}{7}u^5 + \frac{5}{7}u^4 + \cdots + \frac{2}{7}u + \frac{6}{7} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{7}u^5 - \frac{3}{49}u^4 + \cdots + \frac{11}{7}u - \frac{40}{49} \\ -\frac{5}{7}u^5 - \frac{1}{7}u^4 + \cdots + \frac{1}{7}u - \frac{4}{7} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^4 + 4u^2 + 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^3 - 3u^2 + 2u + 1)^2$
c_2	$(u^3 + u^2 + 2u + 1)^2$
c_3	$49(49u^6 - 14u^5 + 72u^4 - 32u^3 + 47u^2 - 26u + 5)$
c_4, c_9, c_{10}	$u^6 + u^4 + 2u^2 + 1$
c_5	$49(49u^6 + 14u^5 + 72u^4 + 32u^3 + 47u^2 + 26u + 5)$
c_6	$(u^3 - u^2 + 2u - 1)^2$
c_7, c_8, c_{11} c_{12}	$(u^2 + 1)^3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^3 - 5y^2 + 10y - 1)^2$
c_2, c_6	$(y^3 + 3y^2 + 2y - 1)^2$
c_3, c_5	$2401(2401y^6 + 6860y^5 + \cdots - 206y + 25)$
c_4, c_9, c_{10}	$(y^3 + y^2 + 2y + 1)^2$
c_7, c_8, c_{11} c_{12}	$(y + 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.744862 + 0.877439I$ $a = 0.262343 - 1.117840I$ $b = 1.000000I$	$0.26574 - 2.82812I$	$-3.50976 + 2.97945I$
$u = 0.744862 - 0.877439I$ $a = 0.262343 + 1.117840I$ $b = -1.000000I$	$0.26574 + 2.82812I$	$-3.50976 - 2.97945I$
$u = -0.744862 + 0.877439I$ $a = -0.749579 - 0.640043I$ $b = 1.000000I$	$0.26574 + 2.82812I$	$-3.50976 - 2.97945I$
$u = -0.744862 - 0.877439I$ $a = -0.749579 + 0.640043I$ $b = -1.000000I$	$0.26574 - 2.82812I$	$-3.50976 + 2.97945I$
$u = 0.754878I$ $a = -1.22705 + 1.52783I$ $b = -1.000000I$	4.40332	3.01950
$u = -0.754878I$ $a = -1.22705 - 1.52783I$ $b = 1.000000I$	4.40332	3.01950

IV. $I_4^u = \langle b+1,\ 8a^2 - 2au - 8a + u + 1,\ u^2 + 2 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ -2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ -u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} a \\ -1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} a+1 \\ -1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -2au + \frac{1}{2}a + \frac{9}{8}u - \frac{1}{4} \\ au - u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a \\ -1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} a-1 \\ -1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} au + \frac{1}{2}a - \frac{7}{8}u - \frac{1}{4} \\ au \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -2au + 2a + \frac{7}{8}u - \frac{3}{2} \\ au - 2a - \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -8au + 4u - 8$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u^2 - u + 1)^2$
c_3	$16(16u^4 + 16u^3 + 28u^2 + 12u + 3)$
c_4, c_9, c_{10}	$(u^2 + 2)^2$
c_5	$16(16u^4 - 16u^3 + 28u^2 - 12u + 3)$
c_6	$(u^2 + u + 1)^2$
c_7, c_8	$(u + 1)^4$
c_{11}, c_{12}	$(u - 1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6	$(y^2 + y + 1)^2$
c_3, c_5	$256(256y^4 + 640y^3 + 496y^2 + 24y + 9)$
c_4, c_9, c_{10}	$(y + 2)^4$
c_7, c_8, c_{11} c_{12}	$(y - 1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.414210I$ $a = 0.806186 + 0.176777I$ $b = -1.00000$	$3.28987 + 2.02988I$	$-6.00000 - 3.46410I$
$u = 1.414210I$ $a = 0.193814 + 0.176777I$ $b = -1.00000$	$3.28987 - 2.02988I$	$-6.00000 + 3.46410I$
$u = -1.414210I$ $a = 0.806186 - 0.176777I$ $b = -1.00000$	$3.28987 - 2.02988I$	$-6.00000 + 3.46410I$
$u = -1.414210I$ $a = 0.193814 - 0.176777I$ $b = -1.00000$	$3.28987 + 2.02988I$	$-6.00000 - 3.46410I$

V. $I_1^v = \langle a,\ b-1,\ 4v^2+2v+1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 7v - \frac{25}{2}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6	$y^2 + y + 1$
c_3, c_5	$16(16y^2 + 4y + 1)$
c_4, c_9, c_{10}	y^2
c_7, c_8, c_{11} c_{12}	$(y-1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = -0.250000 + 0.433013I$ $a = 0$ $b = 1.00000$	$-1.64493 + 2.02988I$	$-14.2500 + 3.0311I$
$v = -0.250000 - 0.433013I$ $a = 0$ $b = 1.00000$	$-1.64493 - 2.02988I$	$-14.2500 - 3.0311I$

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^3)(u^3-3u^2+2u+1)^2(u^{26}+9u^{25}+\cdots+5u+1)^2$ $\cdot(u^{39}+18u^{38}+\cdots+4081u-576)$
c_2	$((u^2-u+1)^2)(u^2+u+1)(u^3+u^2+2u+1)^2(u^{26}-u^{25}+\cdots-u+1)^2$ $\cdot(u^{39}-2u^{38}+\cdots-7u+24)$
c_3	$1806336(4u^2-2u+1)(16u^4+16u^3+28u^2+12u+3)$ $\cdot(49u^6-14u^5+72u^4-32u^3+47u^2-26u+5)$ $\cdot(64u^{39}-32u^{38}+\cdots+42u+7)$ $\cdot(9u^{52}-87u^{51}+\cdots-32765418u+6443297)$
c_4,c_9,c_{10}	$u^2(u^2+2)^2(u^6+u^4+2u^2+1)(u^{26}+u^{25}+\cdots-u+1)^2$ $\cdot(u^{39}-3u^{38}+\cdots-96u+32)$
c_5	$1806336(4u^2+2u+1)(16u^4-16u^3+28u^2-12u+3)$ $\cdot(49u^6+14u^5+72u^4+32u^3+47u^2+26u+5)$ $\cdot(64u^{39}-32u^{38}+\cdots+42u+7)$ $\cdot(9u^{52}-87u^{51}+\cdots-32765418u+6443297)$
c_6	$(u^2-u+1)(u^2+u+1)^2(u^3-u^2+2u-1)^2(u^{26}-u^{25}+\cdots-u+1)^2$ $\cdot(u^{39}-2u^{38}+\cdots-7u+24)$
c_7,c_8	$((u-1)^2)(u+1)^4(u^2+1)^3(u^{39}-2u^{38}+\cdots-34u+3)$ $\cdot(u^{52}+5u^{51}+\cdots+548u+125)$
c_{11},c_{12}	$((u-1)^4)(u+1)^2(u^2+1)^3(u^{39}-2u^{38}+\cdots-34u+3)$ $\cdot(u^{52}+5u^{51}+\cdots+548u+125)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^2+y+1)^3)(y^3-5y^2+10y-1)^2(y^{26}+17y^{25}+\cdots+29y+1)^2$ $\cdot(y^{39}+10y^{38}+\cdots+63273697y-331776)$
c_2, c_6	$((y^2+y+1)^3)(y^3+3y^2+2y-1)^2(y^{26}+9y^{25}+\cdots+5y+1)^2$ $\cdot(y^{39}+18y^{38}+\cdots+4081y-576)$
c_3, c_5	$3262849744896(16y^2+4y+1)(256y^4+640y^3+\cdots+24y+9)$ $\cdot(2401y^6+6860y^5+8894y^4+5506y^3+1265y^2-206y+25)$ $\cdot(4096y^{39}+134144y^{38}+\cdots+294y-49)$ $\cdot(81y^{52}+2835y^{51}+\cdots+516271175779380y+41516076230209)$
c_4, c_9, c_{10}	$y^2(y+2)^4(y^3+y^2+2y+1)^2(y^{26}+29y^{25}+\cdots+5y+1)^2$ $\cdot(y^{39}+39y^{38}+\cdots-17408y-1024)$
c_7, c_8, c_{11} c_{12}	$((y-1)^6)(y+1)^6(y^{39}+28y^{38}+\cdots-32y-9)$ $\cdot(y^{52}+39y^{51}+\cdots+151696y+15625)$