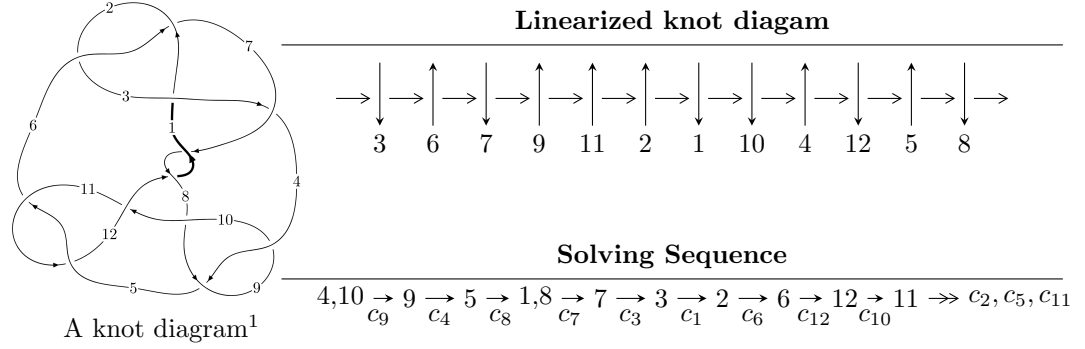


12a₀₂₂₉ (K12a₀₂₂₉)



Ideals for irreducible components² of X_{par}

$$I_1^u = \langle -u^{45} - u^{44} + \dots + 64b - 1, -u^{45} - u^{44} + \dots + 64a - 65, u^{46} + 9u^{44} + \dots + 7u^2 + 1 \rangle$$

$$I_2^u = \langle 5.89603 \times 10^{55}u^{65} + 1.20824 \times 10^{54}u^{64} + \dots + 8.65172 \times 10^{55}b - 2.59504 \times 10^{56}, \\ -3.37617 \times 10^{56}u^{65} + 7.20416 \times 10^{53}u^{64} + \dots + 1.47079 \times 10^{57}a + 7.90685 \times 10^{57}, \\ u^{66} + u^{65} + \dots - 10u + 17 \rangle$$

$$I_3^u = \langle b - a - 1, a^6 + a^5u + a^4 + 2a^3u + au - 1, u^2 + 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 124 representations.

¹The 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>).

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

$$\langle -u^{45} - u^{44} + \dots + 64b - 1, -u^{45} - u^{44} + \dots + 64a - 65, u^{46} + 9u^{44} + \dots + 7u^2 + 1 \rangle$$

I. $I_1^u =$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 0.0156250u^{45} + 0.0156250u^{44} + \dots + 0.0156250u + 1.01563 \\ 0.0156250u^{45} + 0.0156250u^{44} + \dots + 0.0156250u + 0.0156250 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{9}{32}u^{45} - \frac{7}{32}u^{44} + \dots - \frac{5}{16}u + \frac{3}{4} \\ -0.265625u^{45} - 0.203125u^{44} + \dots - 0.296875u - 0.234375 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.546875u^{45} - 2.51563u^{44} + \dots + 3.04688u - 4.82813 \\ \frac{3}{16}u^{45} - \frac{29}{16}u^{44} + \dots + \frac{19}{8}u - \frac{15}{4} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 3.37500u^{45} + 2.65625u^{44} + \dots + 3.84375u + 8.18750 \\ 0.609375u^{45} + 2.07813u^{44} + \dots - 1.32813u + 5.20313 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.0156250u^{45} - 0.0156250u^{44} + \dots + 2.01563u - 0.0156250 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.0156250u^{45} + 0.0156250u^{44} + \dots + 0.0156250u + 1.01563 \\ -u^2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.0156250u^{45} + 0.0156250u^{44} + \dots + 0.0156250u + 1.01563 \\ u^4 \end{pmatrix}$$

(ii) Obstruction class = -1

$$(iii) \text{ Cusp Shapes} = -\frac{105}{8}u^{45} - \frac{21}{16}u^{44} + \dots - \frac{565}{16}u - \frac{113}{8}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{46} + 21u^{45} + \dots + 11u + 4$
c_2, c_6	$u^{46} - 3u^{45} + \dots - 9u + 2$
c_3	$u^{46} + 3u^{45} + \dots + 107u + 10$
c_4, c_5, c_9 c_{11}	$u^{46} + 9u^{44} + \dots + 7u^2 + 1$
c_7, c_{12}	$u^{46} - 15u^{45} + \dots - 1507u + 86$
c_8, c_{10}	$u^{46} + 18u^{45} + \dots + 14u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{46} + 9y^{45} + \dots + 223y + 16$
c_2, c_6	$y^{46} + 21y^{45} + \dots + 11y + 4$
c_3	$y^{46} - 3y^{45} + \dots + 1291y + 100$
c_4, c_5, c_9 c_{11}	$y^{46} + 18y^{45} + \dots + 14y + 1$
c_7, c_{12}	$y^{46} + 33y^{45} + \dots + 3995y + 7396$
c_8, c_{10}	$y^{46} + 34y^{45} + \dots + 10y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.453798 + 0.886038I$ $a = -0.518488 - 0.986312I$ $b = -0.628069 - 0.859043I$	$-0.222379 + 1.215080I$	$1.36610 - 3.95525I$
$u = 0.453798 - 0.886038I$ $a = -0.518488 + 0.986312I$ $b = -0.628069 + 0.859043I$	$-0.222379 - 1.215080I$	$1.36610 + 3.95525I$
$u = -0.414852 + 0.902837I$ $a = -0.580217 + 1.132110I$ $b = -0.789537 + 0.917855I$	$-2.46322 + 3.60580I$	$-2.18163 + 0.39698I$
$u = -0.414852 - 0.902837I$ $a = -0.580217 - 1.132110I$ $b = -0.789537 - 0.917855I$	$-2.46322 - 3.60580I$	$-2.18163 - 0.39698I$
$u = 0.790815 + 0.593419I$ $a = -0.943712 + 1.023240I$ $b = -1.41071 - 0.42824I$	$2.22826 + 0.91205I$	$0.81467 - 2.41303I$
$u = 0.790815 - 0.593419I$ $a = -0.943712 - 1.023240I$ $b = -1.41071 + 0.42824I$	$2.22826 - 0.91205I$	$0.81467 + 2.41303I$
$u = 0.870127 + 0.560804I$ $a = -1.09824 + 1.81645I$ $b = -1.78431 - 0.02343I$	$5.68391 - 6.06712I$	$4.11286 + 2.85082I$
$u = 0.870127 - 0.560804I$ $a = -1.09824 - 1.81645I$ $b = -1.78431 + 0.02343I$	$5.68391 + 6.06712I$	$4.11286 - 2.85082I$
$u = -0.862114 + 0.584878I$ $a = -1.27282 - 1.61053I$ $b = -1.81791 + 0.20704I$	$7.53593 + 0.80904I$	$6.84506 + 1.79517I$
$u = -0.862114 - 0.584878I$ $a = -1.27282 + 1.61053I$ $b = -1.81791 - 0.20704I$	$7.53593 - 0.80904I$	$6.84506 - 1.79517I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.465756 + 0.955541I$		
$a = -0.695688 + 0.882644I$	$-4.46301 - 3.83863I$	$-5.71058 + 5.98205I$
$b = -0.691882 + 0.533495I$		
$u = -0.465756 - 0.955541I$		
$a = -0.695688 - 0.882644I$	$-4.46301 + 3.83863I$	$-5.71058 - 5.98205I$
$b = -0.691882 - 0.533495I$		
$u = -0.849958 + 0.645895I$		
$a = -1.68005 - 1.09469I$	$7.74972 - 2.19444I$	$6.89266 + 2.45609I$
$b = -1.87294 + 0.67358I$		
$u = -0.849958 - 0.645895I$		
$a = -1.68005 + 1.09469I$	$7.74972 + 2.19444I$	$6.89266 - 2.45609I$
$b = -1.87294 - 0.67358I$		
$u = 0.603424 + 0.895317I$		
$a = -0.644386 - 0.881769I$	$1.23442 + 2.67713I$	$3.36922 - 2.59442I$
$b = -0.230788 - 1.016890I$		
$u = 0.603424 - 0.895317I$		
$a = -0.644386 + 0.881769I$	$1.23442 - 2.67713I$	$3.36922 + 2.59442I$
$b = -0.230788 + 1.016890I$		
$u = 0.846880 + 0.673209I$		
$a = -1.84146 + 0.85145I$	$6.08105 + 7.44745I$	$4.24669 - 7.37032I$
$b = -1.87497 - 0.89084I$		
$u = 0.846880 - 0.673209I$		
$a = -1.84146 - 0.85145I$	$6.08105 - 7.44745I$	$4.24669 + 7.37032I$
$b = -1.87497 + 0.89084I$		
$u = -0.633634 + 0.963666I$		
$a = -0.504280 + 1.072500I$	$0.71327 - 7.27313I$	$2.09224 + 8.76278I$
$b = 0.236366 + 1.006160I$		
$u = -0.633634 - 0.963666I$		
$a = -0.504280 - 1.072500I$	$0.71327 + 7.27313I$	$2.09224 - 8.76278I$
$b = 0.236366 - 1.006160I$		

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.519262 + 1.061720I$ $a = -0.467890 - 0.377697I$ $b = -0.130004 + 0.410940I$	$-5.69377 + 3.58916I$	$-6.74131 - 3.56160I$
$u = 0.519262 - 1.061720I$ $a = -0.467890 + 0.377697I$ $b = -0.130004 - 0.410940I$	$-5.69377 - 3.58916I$	$-6.74131 + 3.56160I$
$u = -0.561338 + 1.069590I$ $a = -0.163899 + 0.477751I$ $b = 0.419844 - 0.312209I$	$-2.24882 - 7.06051I$	$0. + 6.94740I$
$u = -0.561338 - 1.069590I$ $a = -0.163899 - 0.477751I$ $b = 0.419844 + 0.312209I$	$-2.24882 + 7.06051I$	$0. - 6.94740I$
$u = 0.551052 + 1.101990I$ $a = -0.071980 - 0.190461I$ $b = 0.484358 + 0.807212I$	$-5.06717 + 11.24460I$	$0. - 10.47535I$
$u = 0.551052 - 1.101990I$ $a = -0.071980 + 0.190461I$ $b = 0.484358 - 0.807212I$	$-5.06717 - 11.24460I$	$0. + 10.47535I$
$u = -0.191800 + 0.663575I$ $a = 1.140210 + 0.799016I$ $b = 0.445705 + 0.848122I$	$-1.86300 - 6.50120I$	$0.01710 + 9.47650I$
$u = -0.191800 - 0.663575I$ $a = 1.140210 - 0.799016I$ $b = 0.445705 - 0.848122I$	$-1.86300 + 6.50120I$	$0.01710 - 9.47650I$
$u = -0.680385 + 1.122500I$ $a = 0.95163 + 1.31919I$ $b = 2.44651 + 0.41165I$	$3.16830 - 4.20595I$	0
$u = -0.680385 - 1.122500I$ $a = 0.95163 - 1.31919I$ $b = 2.44651 - 0.41165I$	$3.16830 + 4.20595I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.637968 + 1.149790I$ $a = 1.075670 + 0.581931I$ $b = 2.30570 - 0.63580I$	$-1.36397 - 10.15130I$	0
$u = -0.637968 - 1.149790I$ $a = 1.075670 - 0.581931I$ $b = 2.30570 + 0.63580I$	$-1.36397 + 10.15130I$	0
$u = 0.672717 + 1.137900I$ $a = 1.13922 - 1.13976I$ $b = 2.61594 - 0.09172I$	$4.56281 + 9.42738I$	0
$u = 0.672717 - 1.137900I$ $a = 1.13922 + 1.13976I$ $b = 2.61594 + 0.09172I$	$4.56281 - 9.42738I$	0
$u = 0.657560 + 1.164620I$ $a = 1.43825 - 0.73998I$ $b = 2.85437 + 0.55872I$	$3.79893 + 12.38610I$	0
$u = 0.657560 - 1.164620I$ $a = 1.43825 + 0.73998I$ $b = 2.85437 - 0.55872I$	$3.79893 - 12.38610I$	0
$u = -0.653156 + 1.173940I$ $a = 1.54351 + 0.59524I$ $b = 2.94137 - 0.78964I$	$1.7441 - 17.6502I$	0
$u = -0.653156 - 1.173940I$ $a = 1.54351 - 0.59524I$ $b = 2.94137 + 0.78964I$	$1.7441 + 17.6502I$	0
$u = 0.227292 + 0.602534I$ $a = 0.946702 - 0.561087I$ $b = 0.236149 - 0.664410I$	$0.22874 + 1.90065I$	$3.25027 - 5.49087I$
$u = 0.227292 - 0.602534I$ $a = 0.946702 + 0.561087I$ $b = 0.236149 + 0.664410I$	$0.22874 - 1.90065I$	$3.25027 + 5.49087I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.095271 + 0.604484I$		
$a = 1.38074 + 0.34813I$	$-3.48156 + 0.53333I$	$-3.69135 + 1.16262I$
$b = 0.623368 + 0.381223I$		
$u = -0.095271 - 0.604484I$		
$a = 1.38074 - 0.34813I$	$-3.48156 - 0.53333I$	$-3.69135 - 1.16262I$
$b = 0.623368 - 0.381223I$		
$u = -0.549285 + 0.166329I$		
$a = 1.121100 - 0.280064I$	$-0.57507 + 2.91660I$	$3.28484 - 3.07117I$
$b = -0.194659 + 0.002810I$		
$u = -0.549285 - 0.166329I$		
$a = 1.121100 + 0.280064I$	$-0.57507 - 2.91660I$	$3.28484 + 3.07117I$
$b = -0.194659 - 0.002810I$		
$u = 0.402590 + 0.375609I$		
$a = 0.746074 + 0.056866I$	$0.806831 + 0.956158I$	$5.88567 - 4.97178I$
$b = -0.183897 - 0.258268I$		
$u = 0.402590 - 0.375609I$		
$a = 0.746074 - 0.056866I$	$0.806831 - 0.956158I$	$5.88567 + 4.97178I$
$b = -0.183897 + 0.258268I$		

$$\text{II. } I_2^u = \langle 5.90 \times 10^{55} u^{65} + 1.21 \times 10^{54} u^{64} + \dots + 8.65 \times 10^{55} b - 2.60 \times 10^{56}, -3.38 \times 10^{56} u^{65} + 7.20 \times 10^{53} u^{64} + \dots + 1.47 \times 10^{57} a + 7.91 \times 10^{57}, u^{66} + u^{65} + \dots - 10u + 17 \rangle$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 0.229548u^{65} - 0.000489815u^{64} + \dots + 10.6902u - 5.37591 \\ -0.681487u^{65} - 0.0139654u^{64} + \dots - 17.8484u + 2.99945 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.314447u^{65} + 0.631441u^{64} + \dots - 5.78592u + 10.7227 \\ 0.753344u^{65} + 1.32603u^{64} + \dots - 3.20704u + 11.8842 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.528089u^{65} + 0.521914u^{64} + \dots + 1.80947u + 6.24768 \\ 0.603420u^{65} + 0.952700u^{64} + \dots - 12.3700u + 15.2400 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.668363u^{65} - 0.869270u^{64} + \dots + 8.28192u - 15.7703 \\ -0.807681u^{65} - 1.24173u^{64} + \dots + 24.5036u - 19.7593 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.721121u^{65} - 0.184983u^{64} + \dots - 7.75991u + 0.596452 \\ -0.897559u^{65} - 1.04291u^{64} + \dots + 0.734986u - 15.4876 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.444584u^{65} - 0.258086u^{64} + \dots + 20.5688u - 7.68902 \\ 0.0696875u^{65} + 0.849632u^{64} + \dots - 14.5846u + 12.9454 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.514272u^{65} + 0.591546u^{64} + \dots + 5.98415u + 4.25636 \\ -0.396763u^{65} + 0.578071u^{64} + \dots - 22.5545u + 11.6317 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $3.06404u^{65} + 2.51384u^{64} + \dots + 43.1861u + 13.7906$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{33} + 15u^{32} + \dots + u - 1)^2$
c_2, c_6	$(u^{33} + u^{32} + \dots - u - 1)^2$
c_3	$(u^{33} - u^{32} + \dots + u - 1)^2$
c_4, c_5, c_9 c_{11}	$u^{66} + u^{65} + \dots - 10u + 17$
c_7, c_{12}	$(u^{33} + 5u^{32} + \dots - 31u - 3)^2$
c_8, c_{10}	$u^{66} + 35u^{65} + \dots + 3300u + 289$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{33} + 7y^{32} + \dots + 17y - 1)^2$
c_2, c_6	$(y^{33} + 15y^{32} + \dots + y - 1)^2$
c_3	$(y^{33} - y^{32} + \dots + 33y - 1)^2$
c_4, c_5, c_9 c_{11}	$y^{66} + 35y^{65} + \dots + 3300y + 289$
c_7, c_{12}	$(y^{33} + 27y^{32} + \dots + y - 9)^2$
c_8, c_{10}	$y^{66} - 9y^{65} + \dots + 2025988y + 83521$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.637997 + 0.746933I$ $a = 0.707376 + 0.907548I$ $b = -0.195908 + 0.640657I$	$1.67010 + 2.19825I$	$4.55384 - 3.61625I$
$u = 0.637997 - 0.746933I$ $a = 0.707376 - 0.907548I$ $b = -0.195908 - 0.640657I$	$1.67010 - 2.19825I$	$4.55384 + 3.61625I$
$u = 0.933581 + 0.405295I$ $a = 1.34875 - 1.61985I$ $b = 1.53578 + 0.13197I$	$6.10656 - 6.56751I$	$5.02440 + 3.41838I$
$u = 0.933581 - 0.405295I$ $a = 1.34875 + 1.61985I$ $b = 1.53578 - 0.13197I$	$6.10656 + 6.56751I$	$5.02440 - 3.41838I$
$u = -0.941437 + 0.387951I$ $a = 1.19662 + 1.81135I$ $b = 1.51420 - 0.00571I$	$4.13478 + 11.82880I$	$0. - 7.75337I$
$u = -0.941437 - 0.387951I$ $a = 1.19662 - 1.81135I$ $b = 1.51420 + 0.00571I$	$4.13478 - 11.82880I$	$0. + 7.75337I$
$u = 0.463996 + 0.911170I$ $a = 0.349493 + 0.244956I$ $b = -0.181570 - 0.482458I$	$-0.32048 + 2.39560I$	0
$u = 0.463996 - 0.911170I$ $a = 0.349493 - 0.244956I$ $b = -0.181570 + 0.482458I$	$-0.32048 - 2.39560I$	0
$u = 0.917264 + 0.455623I$ $a = 1.73989 - 1.11188I$ $b = 1.56702 + 0.48201I$	$6.63262 - 3.59396I$	$5.77642 + 0.I$
$u = 0.917264 - 0.455623I$ $a = 1.73989 + 1.11188I$ $b = 1.56702 - 0.48201I$	$6.63262 + 3.59396I$	$5.77642 + 0.I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.909922 + 0.481616I$ $a = 1.89942 + 0.84673I$ $b = 1.55154 - 0.66283I$	$5.11137 - 1.63491I$	0
$u = -0.909922 - 0.481616I$ $a = 1.89942 - 0.84673I$ $b = 1.55154 + 0.66283I$	$5.11137 + 1.63491I$	0
$u = -0.884648 + 0.397496I$ $a = 1.00792 + 1.16230I$ $b = 1.265670 - 0.236812I$	$0.90165 + 4.53523I$	$-1.07914 - 3.09222I$
$u = -0.884648 - 0.397496I$ $a = 1.00792 - 1.16230I$ $b = 1.265670 + 0.236812I$	$0.90165 - 4.53523I$	$-1.07914 + 3.09222I$
$u = -0.300390 + 0.920675I$ $a = 0.743283 - 0.035202I$ $b = 0.475253 + 0.493432I$	$-3.68002 + 0.57246I$	$-4.31906 - 0.48605I$
$u = -0.300390 - 0.920675I$ $a = 0.743283 + 0.035202I$ $b = 0.475253 - 0.493432I$	$-3.68002 - 0.57246I$	$-4.31906 + 0.48605I$
$u = -0.426964 + 0.941414I$ $a = 0.850654 + 0.582037I$ $b = 2.00701 - 1.44410I$	$-4.72027 - 1.50384I$	$-5.59059 + 0.I$
$u = -0.426964 - 0.941414I$ $a = 0.850654 - 0.582037I$ $b = 2.00701 + 1.44410I$	$-4.72027 + 1.50384I$	$-5.59059 + 0.I$
$u = 0.504477 + 0.902534I$ $a = 1.30481 - 1.05656I$ $b = 2.74183 + 1.39613I$	$0.09121 + 3.30675I$	0
$u = 0.504477 - 0.902534I$ $a = 1.30481 + 1.05656I$ $b = 2.74183 - 1.39613I$	$0.09121 - 3.30675I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.483934 + 0.821622I$ $a = 0.81128 - 1.51124I$ $b = 2.66915 + 0.72971I$	$0.382723 + 0.728314I$	$2.50985 - 3.12560I$
$u = 0.483934 - 0.821622I$ $a = 0.81128 + 1.51124I$ $b = 2.66915 - 0.72971I$	$0.382723 - 0.728314I$	$2.50985 + 3.12560I$
$u = -0.517251 + 0.927982I$ $a = 1.50014 + 0.89217I$ $b = 2.79665 - 1.66595I$	$-1.82082 - 8.41845I$	0
$u = -0.517251 - 0.927982I$ $a = 1.50014 - 0.89217I$ $b = 2.79665 + 1.66595I$	$-1.82082 + 8.41845I$	0
$u = -0.674112 + 0.632990I$ $a = 0.998351 - 0.705267I$ $b = 0.294000 - 0.777216I$	$1.67010 + 2.19825I$	$4.55384 - 3.61625I$
$u = -0.674112 - 0.632990I$ $a = 0.998351 + 0.705267I$ $b = 0.294000 + 0.777216I$	$1.67010 - 2.19825I$	$4.55384 + 3.61625I$
$u = -0.484653 + 0.774891I$ $a = 0.57010 + 1.76198I$ $b = 2.65809 - 0.41908I$	$-1.29130 + 4.30723I$	$-0.15179 - 2.03529I$
$u = -0.484653 - 0.774891I$ $a = 0.57010 - 1.76198I$ $b = 2.65809 + 0.41908I$	$-1.29130 - 4.30723I$	$-0.15179 + 2.03529I$
$u = -0.449397 + 1.001370I$ $a = 0.226897 + 0.101974I$ $b = -0.143046 + 1.013760I$	$-2.78381 - 6.56196I$	0
$u = -0.449397 - 1.001370I$ $a = 0.226897 - 0.101974I$ $b = -0.143046 - 1.013760I$	$-2.78381 + 6.56196I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.257434 + 1.094910I$		
$a = 0.0251847 + 0.1071140I$	-4.29591	0
$b = 0.452509 - 0.902222I$		
$u = -0.257434 - 1.094910I$		
$a = 0.0251847 - 0.1071140I$	-4.29591	0
$b = 0.452509 + 0.902222I$		
$u = 0.343777 + 1.105690I$		
$a = 0.187558 + 0.200394I$	-6.89729 + 3.47782I	0
$b = 0.43156 + 1.64957I$		
$u = 0.343777 - 1.105690I$		
$a = 0.187558 - 0.200394I$	-6.89729 - 3.47782I	0
$b = 0.43156 - 1.64957I$		
$u = -0.030805 + 1.168110I$		
$a = 0.484368 + 0.318616I$	-3.83648 + 1.45331I	0
$b = 0.900369 + 0.205762I$		
$u = -0.030805 - 1.168110I$		
$a = 0.484368 - 0.318616I$	-3.83648 - 1.45331I	0
$b = 0.900369 - 0.205762I$		
$u = 0.288407 + 1.172200I$		
$a = -0.253326 + 0.071690I$	-6.89729 - 3.47782I	0
$b = -0.267177 + 1.092650I$		
$u = 0.288407 - 1.172200I$		
$a = -0.253326 - 0.071690I$	-6.89729 + 3.47782I	0
$b = -0.267177 - 1.092650I$		
$u = 0.656637 + 1.031850I$		
$a = -1.027100 + 0.658267I$	0.90165 + 4.53523I	0
$b = -2.09488 - 0.71512I$		
$u = 0.656637 - 1.031850I$		
$a = -1.027100 - 0.658267I$	0.90165 - 4.53523I	0
$b = -2.09488 + 0.71512I$		

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.721713 + 0.991329I$ $a = -0.93016 + 1.47763I$ $b = -2.38581 + 0.26537I$	$5.11137 - 1.63491I$	0
$u = 0.721713 - 0.991329I$ $a = -0.93016 - 1.47763I$ $b = -2.38581 - 0.26537I$	$5.11137 + 1.63491I$	0
$u = -0.711282 + 1.012820I$ $a = -1.12655 - 1.28477I$ $b = -2.51046 + 0.04517I$	$6.63262 - 3.59396I$	0
$u = -0.711282 - 1.012820I$ $a = -1.12655 + 1.28477I$ $b = -2.51046 - 0.04517I$	$6.63262 + 3.59396I$	0
$u = -0.186059 + 0.718013I$ $a = -0.594692 + 0.693227I$ $b = 1.60792 - 0.14369I$	$-3.83648 - 1.45331I$	$-1.02647 + 4.36257I$
$u = -0.186059 - 0.718013I$ $a = -0.594692 - 0.693227I$ $b = 1.60792 + 0.14369I$	$-3.83648 + 1.45331I$	$-1.02647 - 4.36257I$
$u = -0.692455 + 1.054890I$ $a = -1.47281 - 0.84922I$ $b = -2.70026 + 0.70137I$	$6.10656 - 6.56751I$	0
$u = -0.692455 - 1.054890I$ $a = -1.47281 + 0.84922I$ $b = -2.70026 - 0.70137I$	$6.10656 + 6.56751I$	0
$u = -0.169724 + 1.257390I$ $a = -0.335329 + 0.769886I$ $b = -0.376907 + 0.480621I$	$-4.72027 + 1.50384I$	0
$u = -0.169724 - 1.257390I$ $a = -0.335329 - 0.769886I$ $b = -0.376907 - 0.480621I$	$-4.72027 - 1.50384I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.687356 + 1.070450I$ $a = -1.59784 + 0.68287I$ $b = -2.76982 - 0.94884I$	$4.13478 + 11.82880I$	0
$u = 0.687356 - 1.070450I$ $a = -1.59784 - 0.68287I$ $b = -2.76982 + 0.94884I$	$4.13478 - 11.82880I$	0
$u = -0.614981 + 0.372347I$ $a = 0.383921 - 0.470183I$ $b = 0.654601 - 0.381474I$	$-0.32048 + 2.39560I$	$1.63078 - 3.31266I$
$u = -0.614981 - 0.372347I$ $a = 0.383921 + 0.470183I$ $b = 0.654601 + 0.381474I$	$-0.32048 - 2.39560I$	$1.63078 + 3.31266I$
$u = 0.663400 + 0.268651I$ $a = -0.169166 + 0.341915I$ $b = 0.662261 + 0.326054I$	$-2.78381 - 6.56196I$	$-2.35976 + 7.19745I$
$u = 0.663400 - 0.268651I$ $a = -0.169166 - 0.341915I$ $b = 0.662261 - 0.326054I$	$-2.78381 + 6.56196I$	$-2.35976 - 7.19745I$
$u = -0.068285 + 1.294260I$ $a = 0.384319 + 1.248130I$ $b = 0.583820 + 1.282150I$	$-1.29130 - 4.30723I$	0
$u = -0.068285 - 1.294260I$ $a = 0.384319 - 1.248130I$ $b = 0.583820 - 1.282150I$	$-1.29130 + 4.30723I$	0
$u = 0.095054 + 1.295640I$ $a = 0.141767 - 1.250960I$ $b = 0.254151 - 1.257110I$	$0.382723 - 0.728314I$	0
$u = 0.095054 - 1.295640I$ $a = 0.141767 + 1.250960I$ $b = 0.254151 + 1.257110I$	$0.382723 + 0.728314I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.145273 + 1.310310I$ $a = -0.351267 - 1.269050I$ $b = -0.449389 - 1.233690I$	$0.09121 - 3.30675I$	0
$u = 0.145273 - 1.310310I$ $a = -0.351267 + 1.269050I$ $b = -0.449389 + 1.233690I$	$0.09121 + 3.30675I$	0
$u = -0.162182 + 1.319490I$ $a = -0.547615 + 1.282830I$ $b = -0.73741 + 1.24360I$	$-1.82082 + 8.41845I$	0
$u = -0.162182 - 1.319490I$ $a = -0.547615 - 1.282830I$ $b = -0.73741 - 1.24360I$	$-1.82082 - 8.41845I$	0
$u = 0.439112 + 0.257588I$ $a = 0.36727 + 1.36706I$ $b = 0.689236 + 0.303024I$	$-3.68002 + 0.57246I$	$-4.31906 - 0.48605I$
$u = 0.439112 - 0.257588I$ $a = 0.36727 - 1.36706I$ $b = 0.689236 - 0.303024I$	$-3.68002 - 0.57246I$	$-4.31906 + 0.48605I$

$$\text{III. } I_3^u = \langle b - a - 1, a^6 + a^5u + a^4 + 2a^3u + au - 1, u^2 + 1 \rangle$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

$$a_1 = \begin{pmatrix} a \\ a + 1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -a^2 \\ -a^2 - a - 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} a^4u \\ a^4u + a^3u + a^2u + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} a^5 + a^4u + 2a^3 + a^2u + a + u \\ a^5u + a^4u + 2a^3u + a^2u + au + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -au \\ -u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} a + 1 \\ 1 \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = $-4a^4 - 4a^2 - 4au - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$		
$a = 0.295542 + 1.002190I$	$-1.39926 - 0.92430I$	$-2.28328 + 0.79423I$
$b = 1.29554 + 1.00219I$		
$u = 1.000000I$		
$a = -0.295542 + 1.002190I$	$-1.39926 + 0.92430I$	$-2.28328 - 0.79423I$
$b = 0.704458 + 1.002190I$		
$u = 1.000000I$		
$a = -0.664531 - 0.428243I$	$-5.18047 - 0.92430I$	$-9.71672 + 0.79423I$
$b = 0.335469 - 0.428243I$		
$u = 1.000000I$		
$a = 0.664531 - 0.428243I$	$-5.18047 + 0.92430I$	$-9.71672 - 0.79423I$
$b = 1.66453 - 0.42824I$		
$u = 1.000000I$		
$a = 0.558752 - 1.073950I$	$-3.28987 + 5.69302I$	$-6.00000 - 5.51057I$
$b = 1.55875 - 1.07395I$		
$u = 1.000000I$		
$a = -0.558752 - 1.073950I$	$-3.28987 - 5.69302I$	$-6.00000 + 5.51057I$
$b = 0.441248 - 1.073950I$		
$u = -1.000000I$		
$a = -0.295542 - 1.002190I$	$-1.39926 + 0.92430I$	$-2.28328 - 0.79423I$
$b = 0.704458 - 1.002190I$		
$u = -1.000000I$		
$a = 0.295542 - 1.002190I$	$-1.39926 - 0.92430I$	$-2.28328 + 0.79423I$
$b = 1.29554 - 1.00219I$		
$u = -1.000000I$		
$a = 0.664531 + 0.428243I$	$-5.18047 + 0.92430I$	$-9.71672 - 0.79423I$
$b = 1.66453 + 0.42824I$		
$u = -1.000000I$		
$a = -0.664531 + 0.428243I$	$-5.18047 - 0.92430I$	$-9.71672 + 0.79423I$
$b = 0.335469 + 0.428243I$		

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.000000I$		
$a = 0.558752 + 1.073950I$	$-3.28987 - 5.69302I$	$-6.00000 + 5.51057I$
$b = 1.55875 + 1.07395I$		
$u = -1.000000I$		
$a = -0.558752 + 1.073950I$	$-3.28987 + 5.69302I$	$-6.00000 - 5.51057I$
$b = 0.441248 + 1.073950I$		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)^2)(u^{33} + 15u^{32} + \dots + u - 1)^2$ $\cdot (u^{46} + 21u^{45} + \dots + 11u + 4)$
c_2, c_6	$(u^{12} + 3u^{10} + \dots + u^2 + 1)(u^{33} + u^{32} + \dots - u - 1)^2$ $\cdot (u^{46} - 3u^{45} + \dots - 9u + 2)$
c_3	$(u^{12} - u^{10} + 5u^8 + 6u^4 - 3u^2 + 1)(u^{33} - u^{32} + \dots + u - 1)^2$ $\cdot (u^{46} + 3u^{45} + \dots + 107u + 10)$
c_4, c_5, c_9 c_{11}	$((u^2 + 1)^6)(u^{46} + 9u^{44} + \dots + 7u^2 + 1)(u^{66} + u^{65} + \dots - 10u + 17)$
c_7, c_{12}	$(u^{12} + 3u^{10} + \dots + u^2 + 1)(u^{33} + 5u^{32} + \dots - 31u - 3)^2$ $\cdot (u^{46} - 15u^{45} + \dots - 1507u + 86)$
c_8, c_{10}	$((u - 1)^{12})(u^{46} + 18u^{45} + \dots + 14u + 1)$ $\cdot (u^{66} + 35u^{65} + \dots + 3300u + 289)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2)(y^{33} + 7y^{32} + \dots + 17y - 1)^2$ $\cdot (y^{46} + 9y^{45} + \dots + 223y + 16)$
c_2, c_6	$((y^6 + 3y^5 + 5y^4 + 4y^3 + 2y^2 + y + 1)^2)(y^{33} + 15y^{32} + \dots + y - 1)^2$ $\cdot (y^{46} + 21y^{45} + \dots + 11y + 4)$
c_3	$((y^6 - y^5 + 5y^4 + 6y^2 - 3y + 1)^2)(y^{33} - y^{32} + \dots + 33y - 1)^2$ $\cdot (y^{46} - 3y^{45} + \dots + 1291y + 100)$
c_4, c_5, c_9 c_{11}	$((y + 1)^{12})(y^{46} + 18y^{45} + \dots + 14y + 1)$ $\cdot (y^{66} + 35y^{65} + \dots + 3300y + 289)$
c_7, c_{12}	$((y^6 + 3y^5 + 5y^4 + 4y^3 + 2y^2 + y + 1)^2)(y^{33} + 27y^{32} + \dots + y - 9)^2$ $\cdot (y^{46} + 33y^{45} + \dots + 3995y + 7396)$
c_8, c_{10}	$((y - 1)^{12})(y^{46} + 34y^{45} + \dots + 10y + 1)$ $\cdot (y^{66} - 9y^{65} + \dots + 2025988y + 83521)$