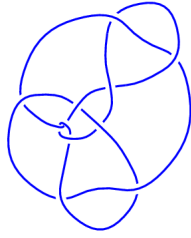
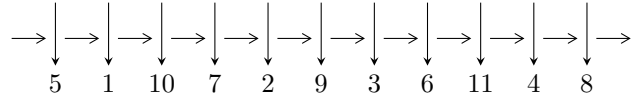


11a₁₂₄ (K11a₁₂₄)

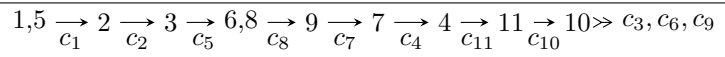


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = \bigcap_{i=1}^3 I_i^u$$

$$I_1^u = \langle u^2 + u - 1, 2a + u + 2, 2b + u + 1 \rangle$$

$$I_2^u = \langle u^{19} - u^{18} + \dots + 2u + 1, -u^{18} - u^{17} + \dots + 8b + 3, -7u^{18} + 2u^{17} + \dots + 8a - 4 \rangle$$

$$I_3^u = \langle u^{60} + 3u^{59} + \dots + 2u + 1, 1.82981 \times 10^{42}u^{59} + 3.77381 \times 10^{43}u^{58} + \dots + 3.61424 \times 10^{43}b + 5.32699 \times 10^{43} \\ 1.13957 \times 10^{44}u^{59} + 2.18979 \times 10^{44}u^{58} + \dots + 3.61424 \times 10^{43}a + 6.29591 \times 10^{43} \rangle$$

There are 3 irreducible components with 81 representations.

¹The knot diagram image is adapter from “C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, <http://www.indiana.edu/~knotinfo>”

$$\mathbf{I. } I_1^u = \langle u^2 + u - 1, 2a + u + 2, 2b + u + 1 \rangle$$

(i) Arc colorings

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

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

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

$$a_3 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ -u + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{1}{2}u - 1 \\ -\frac{1}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{1}{2}u - 1 \\ \frac{1}{2}u - \frac{3}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{1}{2}u - 1 \\ -\frac{1}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{2}u + \frac{3}{4} \\ \frac{3}{4}u + \frac{1}{2} \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} -\frac{3}{4}u - \frac{1}{4} \\ \frac{1}{2}u - \frac{7}{4} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{3}{4}u - \frac{1}{4} \\ \frac{1}{2}u - \frac{7}{4} \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.61803$ $a = -0.190983$ $b = 0.309017$	-10.5276	53.7910
$u = 0.618034$ $a = -1.30902$ $b = -0.809017$	-2.63189	-13.2910

II.

$$I_2^u = \langle u^{19} - u^{18} + \dots + 2u + 1, -u^{18} - u^{17} + \dots + 8b + 3, -7u^{18} + 2u^{17} + \dots + 8a - 4 \rangle$$

(i) Arc colorings

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

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

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

$$a_3 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{7}{8}u^{18} - \frac{1}{4}u^{17} + \dots - \frac{27}{8}u + \frac{1}{2} \\ \frac{1}{8}u^{18} + \frac{1}{8}u^{17} + \dots - \frac{1}{4}u - \frac{3}{8} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{5}{8}u^{18} - \frac{1}{4}u^{17} + \dots - \frac{13}{8}u + 1 \\ \frac{3}{8}u^{18} - \frac{1}{8}u^{17} + \dots - \frac{5}{4}u - \frac{5}{8} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{3}{8}u^{18} - \frac{1}{4}u^{17} + \dots - \frac{15}{8}u + \frac{1}{2} \\ \frac{5}{8}u^{18} - \frac{3}{8}u^{17} + \dots + \frac{3}{4}u + \frac{1}{8} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.500000u^{18} + 0.187500u^{17} + \dots + 0.937500u - 0.187500 \\ -\frac{5}{16}u^{18} + \frac{1}{8}u^{17} + \dots + \frac{29}{16}u + \frac{1}{2} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{1}{2}u^{18} - \frac{3}{16}u^{17} + \dots - \frac{31}{16}u + \frac{19}{16} \\ \frac{5}{16}u^{18} - \frac{1}{8}u^{17} + \dots - \frac{13}{16}u - \frac{1}{2} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.812500u^{18} - 0.312500u^{17} + \dots - 2.75000u + 0.687500 \\ \frac{1}{2}u^{18} - \frac{3}{16}u^{17} + \dots - \frac{31}{16}u - \frac{13}{16} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.812500u^{18} - 0.312500u^{17} + \dots - 2.75000u + 0.687500 \\ \frac{1}{2}u^{18} - \frac{3}{16}u^{17} + \dots - \frac{31}{16}u - \frac{13}{16} \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.136916 - 0.651601I$ $a = 0.65818 - 1.73896I$ $b = 1.34054 + 1.29468I$	$-2.2580 - 17.5240I$	$-13.4299 + 10.5127I$
$u = -1.136916 + 0.651601I$ $a = 0.65818 + 1.73896I$ $b = 1.34054 - 1.29468I$	$-2.2580 + 17.5240I$	$-13.4299 - 10.5127I$
$u = -1.047054 - 0.609446I$ $a = -1.22126 + 1.31935I$ $b = -0.916684 - 0.916299I$	$1.58848 - 10.77564I$	$-11.1069 + 9.6699I$
$u = -1.047054 + 0.609446I$ $a = -1.22126 - 1.31935I$ $b = -0.916684 + 0.916299I$	$1.58848 + 10.77564I$	$-11.1069 - 9.6699I$
$u = -1.003446 - 0.392686I$ $a = 0.707057 + 0.579787I$ $b = 0.874647 - 0.155083I$	$-5.55704 - 4.23947I$	$-20.3915 + 6.1738I$
$u = -1.003446 + 0.392686I$ $a = 0.707057 - 0.579787I$ $b = 0.874647 + 0.155083I$	$-5.55704 + 4.23947I$	$-20.3915 - 6.1738I$
$u = -0.460389$ $a = 1.06379$ $b = -0.317250$	-0.745623	-13.0539
$u = -0.459746 - 0.391888I$ $a = 1.36942 - 1.12473I$ $b = -0.546470 + 0.196255I$	$-0.672184 + 0.228526I$	$-10.04556 - 0.04203I$
$u = -0.459746 + 0.391888I$ $a = 1.36942 + 1.12473I$ $b = -0.546470 - 0.196255I$	$-0.672184 - 0.228526I$	$-10.04556 + 0.04203I$
$u = 0.419051 - 0.893130I$ $a = 1.02280 + 1.08508I$ $b = -0.88707 - 1.18884I$	$2.04820 - 6.16450I$	$-8.26103 + 3.38099I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.419051 + 0.893130I$ $a = 1.02280 - 1.08508I$ $b = -0.88707 + 1.18884I$	$2.04820 + 6.16450I$	$-8.26103 - 3.38099I$
$u = 0.552607 - 0.734353I$ $a = -0.168882 - 0.964693I$ $b = 0.525535 + 1.017191I$	$4.59036 - 0.49883I$	$-5.13235 - 1.11737I$
$u = 0.552607 + 0.734353I$ $a = -0.168882 + 0.964693I$ $b = 0.525535 - 1.017191I$	$4.59036 + 0.49883I$	$-5.13235 + 1.11737I$
$u = 0.899345 - 0.246437I$ $a = -1.29580 - 0.85374I$ $b = -0.851974 - 0.161845I$	$-3.77143 + 0.86442I$	$-19.7475 - 1.3057I$
$u = 0.899345 + 0.246437I$ $a = -1.29580 + 0.85374I$ $b = -0.851974 + 0.161845I$	$-3.77143 - 0.86442I$	$-19.7475 + 1.3057I$
$u = 1.034007 - 0.500803I$ $a = 0.21939 + 2.02506I$ $b = 0.705355 - 0.326372I$	$-3.99870 + 8.26948I$	$-17.0118 - 10.4497I$
$u = 1.034007 + 0.500803I$ $a = 0.21939 - 2.02506I$ $b = 0.705355 + 0.326372I$	$-3.99870 - 8.26948I$	$-17.0118 + 10.4497I$
$u = 1.36120$ $a = 0.00253791$ $b = 0.897992$	-10.4347	-25.7619
$u = 1.58350$ $a = -0.148131$ $b = 0.431492$	-10.5925	-69.4312

$$\text{III. } I_3^u = \langle u^{60} + 3u^{59} + \dots + 2u + 1, 1.83 \times 10^{42}u^{59} + 3.77 \times 10^{43}u^{58} + \dots + 3.61 \times 10^{43}b + 5.33 \times 10^{43}, 1.14 \times 10^{44}u^{59} + 2.19 \times 10^{44}u^{58} + \dots + 3.61 \times 10^{43}a + 6.30 \times 10^{43} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ u^2 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix} \\ a_6 &= \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix} \\ a_8 &= \begin{pmatrix} -3.15299u^{59} - 6.05878u^{58} + \dots - 2.82713u - 1.74198 \\ -0.0506279u^{59} - 1.04415u^{58} + \dots + 1.27325u - 1.47389 \end{pmatrix} \\ a_9 &= \begin{pmatrix} -2.22663u^{59} - 3.85868u^{58} + \dots - 0.723960u - 0.390639 \\ -0.667541u^{59} - 2.57759u^{58} + \dots - 0.598295u - 2.24623 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -2.66161u^{59} - 5.04431u^{58} + \dots - 0.245388u - 1.41555 \\ 0.369464u^{59} - 0.0318110u^{58} + \dots + 1.77699u - 0.766280 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 2.93578u^{59} + 7.22770u^{58} + \dots - 1.11359u + 4.57155 \\ -3.86144u^{59} - 9.46617u^{58} + \dots - 2.54585u - 2.78509 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -2.32643u^{59} - 2.66843u^{58} + \dots - 6.03707u + 0.968638 \\ 0.0449952u^{59} - 3.08652u^{58} + \dots + 0.845286u - 1.41144 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 2.07506u^{59} + 7.05195u^{58} + \dots + 4.94421u + 3.94494 \\ 0.292091u^{59} - 0.0412928u^{58} + \dots - 1.52522u - 1.27482 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 2.07506u^{59} + 7.05195u^{58} + \dots + 4.94421u + 3.94494 \\ 0.292091u^{59} - 0.0412928u^{58} + \dots - 1.52522u - 1.27482 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.277599 - 0.094427I$		
$a = 0.063523 + 0.359982I$	$-3.92001 + 3.29506I$	$-14.4988 - 4.3495I$
$b = -0.928617 + 0.586819I$		
$u = -1.277599 + 0.094427I$		
$a = 0.063523 - 0.359982I$	$-3.92001 - 3.29506I$	$-14.4988 + 4.3495I$
$b = -0.928617 - 0.586819I$		
$u = -1.191576 - 0.532179I$		
$a = 0.803885 - 0.439687I$	$-0.072177 - 1.332496I$	$-7.94680 + 5.19175I$
$b = 0.021291 + 1.030014I$		
$u = -1.191576 + 0.532179I$		
$a = 0.803885 + 0.439687I$	$-0.072177 + 1.332496I$	$-7.94680 - 5.19175I$
$b = 0.021291 - 1.030014I$		
$u = -1.159756 - 0.652820I$		
$a = 0.41234 - 1.36193I$	$-6.23866 - 9.10516I$	$-17.0770 + 6.8244I$
$b = 1.028171 + 0.933144I$		
$u = -1.159756 + 0.652820I$		
$a = 0.41234 + 1.36193I$	$-6.23866 + 9.10516I$	$-17.0770 - 6.8244I$
$b = 1.028171 - 0.933144I$		
$u = -1.004567 - 0.573546I$		
$a = -0.53041 + 1.56112I$	$-1.66693 - 4.72265I$	$-14.9294 + 5.7699I$
$b = -1.021151 - 0.610435I$		
$u = -1.004567 + 0.573546I$		
$a = -0.53041 - 1.56112I$	$-1.66693 + 4.72265I$	$-14.9294 - 5.7699I$
$b = -1.021151 + 0.610435I$		
$u = -1.002751 - 0.506811I$		
$a = -0.37373 + 1.84773I$	$-2.12597 - 4.23565I$	$-12.76145 + 5.43945I$
$b = -0.688910 - 0.733505I$		
$u = -1.002751 + 0.506811I$		
$a = -0.37373 - 1.84773I$	$-2.12597 + 4.23565I$	$-12.76145 - 5.43945I$
$b = -0.688910 + 0.733505I$		

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.998856 - 0.783376I$ $a = -0.484939 - 0.037487I$ $b = -0.016887 - 0.182186I$	$-0.072177 + 1.332496I$	$-7.94680 - 5.19175I$
$u = -0.998856 + 0.783376I$ $a = -0.484939 + 0.037487I$ $b = -0.016887 + 0.182186I$	$-0.072177 - 1.332496I$	$-7.94680 + 5.19175I$
$u = -0.984616 - 0.331650I$ $a = 1.158317 - 0.181794I$ $b = 1.196950 - 0.151388I$	$-5.12713 + 2.00252I$	$-19.8433 - 2.5113I$
$u = -0.984616 + 0.331650I$ $a = 1.158317 + 0.181794I$ $b = 1.196950 + 0.151388I$	$-5.12713 - 2.00252I$	$-19.8433 + 2.5113I$
$u = -0.936320 - 0.528594I$ $a = -0.17160 + 3.12413I$ $b = -2.32581 - 1.71332I$	$-1.14510 - 4.17705I$	$-16.5884 + 2.8209I$
$u = -0.936320 + 0.528594I$ $a = -0.17160 - 3.12413I$ $b = -2.32581 + 1.71332I$	$-1.14510 + 4.17705I$	$-16.5884 - 2.8209I$
$u = -0.789155 - 0.080621I$ $a = 1.168750 + 0.664347I$ $b = -0.224966 + 0.431253I$	$-0.462439 - 0.119450I$	$-11.28349 + 0.62863I$
$u = -0.789155 + 0.080621I$ $a = 1.168750 - 0.664347I$ $b = -0.224966 - 0.431253I$	$-0.462439 + 0.119450I$	$-11.28349 - 0.62863I$
$u = -0.690400 - 0.444793I$ $a = 1.82771 - 0.04254I$ $b = -0.815057 + 0.845937I$	-0.361516	-10.8139
$u = -0.690400 + 0.444793I$ $a = 1.82771 + 0.04254I$ $b = -0.815057 - 0.845937I$	-0.361516	-10.8139

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.636488 - 0.889069I$ $a = -0.429207 - 0.456594I$ $b = 0.267129 + 0.634232I$	$1.01444 - 7.41192I$	$-9.74429 + 9.04041I$
$u = -0.636488 + 0.889069I$ $a = -0.429207 + 0.456594I$ $b = 0.267129 - 0.634232I$	$1.01444 + 7.41192I$	$-9.74429 - 9.04041I$
$u = -0.618191 - 0.540303I$ $a = 0.915777 - 0.561686I$ $b = -0.634590 + 0.550885I$	$-0.462439 + 0.119450I$	$-11.28349 - 0.62863I$
$u = -0.618191 + 0.540303I$ $a = 0.915777 + 0.561686I$ $b = -0.634590 - 0.550885I$	$-0.462439 - 0.119450I$	$-11.28349 + 0.62863I$
$u = -0.519876 - 0.720950I$ $a = 0.270770 - 1.098823I$ $b = -0.711158 + 1.064825I$	$3.14940 + 5.67522I$	$-7.89041 - 4.45785I$
$u = -0.519876 + 0.720950I$ $a = 0.270770 + 1.098823I$ $b = -0.711158 - 1.064825I$	$3.14940 - 5.67522I$	$-7.89041 + 4.45785I$
$u = -0.436655 - 0.898161I$ $a = -1.18120 + 1.04716I$ $b = 1.08197 - 1.19483I$	$-0.13306 + 11.82354I$	$-11.00798 - 6.87881I$
$u = -0.436655 + 0.898161I$ $a = -1.18120 - 1.04716I$ $b = 1.08197 + 1.19483I$	$-0.13306 - 11.82354I$	$-11.00798 + 6.87881I$
$u = -0.398222 - 0.946146I$ $a = -0.840119 + 0.762676I$ $b = 0.769772 - 0.780969I$	$-3.92001 + 3.29506I$	$-14.4988 - 4.3495I$
$u = -0.398222 + 0.946146I$ $a = -0.840119 - 0.762676I$ $b = 0.769772 + 0.780969I$	$-3.92001 - 3.29506I$	$-14.4988 + 4.3495I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.343048 - 0.696449I$ $a = -0.01812 + 1.44166I$ $b = -0.263670 - 1.150539I$	$2.48757 - 3.39736I$	$-6.14839 + 2.65836I$
$u = -0.343048 + 0.696449I$ $a = -0.01812 - 1.44166I$ $b = -0.263670 + 1.150539I$	$2.48757 + 3.39736I$	$-6.14839 - 2.65836I$
$u = 0.100373 - 0.382494I$ $a = -0.68325 - 2.40561I$ $b = 0.272186 - 0.524601I$	$-3.09259 + 1.44484I$	$-13.23226 - 3.70712I$
$u = 0.100373 + 0.382494I$ $a = -0.68325 + 2.40561I$ $b = 0.272186 + 0.524601I$	$-3.09259 - 1.44484I$	$-13.23226 + 3.70712I$
$u = 0.296291 - 0.465226I$ $a = -1.08224 - 1.55917I$ $b = 0.795420 - 0.184236I$	$-2.12597 - 4.23565I$	$-12.76145 + 5.43945I$
$u = 0.296291 + 0.465226I$ $a = -1.08224 + 1.55917I$ $b = 0.795420 + 0.184236I$	$-2.12597 + 4.23565I$	$-12.76145 - 5.43945I$
$u = 0.329797 - 0.800824I$ $a = 0.365600 + 1.285961I$ $b = -0.131590 - 1.165854I$	$3.50080 - 2.14029I$	$-5.17623 + 3.82275I$
$u = 0.329797 + 0.800824I$ $a = 0.365600 - 1.285961I$ $b = -0.131590 + 1.165854I$	$3.50080 + 2.14029I$	$-5.17623 - 3.82275I$
$u = 0.650550 - 0.812563I$ $a = 0.168010 - 0.534412I$ $b = 0.054801 + 0.702804I$	$3.50080 + 2.14029I$	$-5.17623 - 3.82275I$
$u = 0.650550 + 0.812563I$ $a = 0.168010 + 0.534412I$ $b = 0.054801 - 0.702804I$	$3.50080 - 2.14029I$	$-5.17623 + 3.82275I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.750944 - 0.483602I$ $a = -3.54366 - 0.26178I$ $b = 1.36565 + 2.35747I$	$-1.14510 + 4.17705I$	$-16.5884 - 2.8209I$
$u = 0.750944 + 0.483602I$ $a = -3.54366 + 0.26178I$ $b = 1.36565 - 2.35747I$	$-1.14510 - 4.17705I$	$-16.5884 + 2.8209I$
$u = 0.892854 - 0.516085I$ $a = 2.13228 + 8.66517I$ $b = 6.16911 - 6.50212I$	-1.58362	-80.9296
$u = 0.892854 + 0.516085I$ $a = 2.13228 - 8.66517I$ $b = 6.16911 + 6.50212I$	-1.58362	-80.9296
$u = 0.919545 - 0.051720I$ $a = -1.19678 - 0.91487I$ $b = -0.198492 - 0.684850I$	$-1.66693 - 4.72265I$	$-14.9294 + 5.7699I$
$u = 0.919545 + 0.051720I$ $a = -1.19678 + 0.91487I$ $b = -0.198492 + 0.684850I$	$-1.66693 + 4.72265I$	$-14.9294 - 5.7699I$
$u = 0.938385 - 0.379407I$ $a = -0.352880 - 0.442228I$ $b = -1.333265 - 0.305465I$	$-3.09259 + 1.44484I$	$-13.23226 - 3.70712I$
$u = 0.938385 + 0.379407I$ $a = -0.352880 + 0.442228I$ $b = -1.333265 + 0.305465I$	$-3.09259 - 1.44484I$	$-13.23226 + 3.70712I$
$u = 0.985228 - 0.669318I$ $a = 0.581706 + 0.541578I$ $b = 0.476553 - 0.426712I$	$2.48757 + 3.39736I$	$-6.14839 - 2.65836I$
$u = 0.985228 + 0.669318I$ $a = 0.581706 - 0.541578I$ $b = 0.476553 + 0.426712I$	$2.48757 - 3.39736I$	$-6.14839 + 2.65836I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.017566 - 0.457794I$		
$a = -0.09145 + 1.53428I$	$-5.12713 + 2.00252I$	$-19.8433 - 2.5113I$
$b = 0.007078 - 0.330314I$		
$u = 1.017566 + 0.457794I$		
$a = -0.09145 - 1.53428I$	$-5.12713 - 2.00252I$	$-19.8433 + 2.5113I$
$b = 0.007078 + 0.330314I$		
$u = 1.035610 - 0.621202I$		
$a = 1.09062 + 1.10787I$	$3.14940 + 5.67522I$	$-7.89041 - 4.45785I$
$b = 0.783056 - 0.841198I$		
$u = 1.035610 + 0.621202I$		
$a = 1.09062 - 1.10787I$	$3.14940 - 5.67522I$	$-7.89041 + 4.45785I$
$b = 0.783056 + 0.841198I$		
$u = 1.140593 - 0.644966I$		
$a = -0.71375 - 1.57989I$	$-0.13306 + 11.82354I$	$-11.00798 - 6.87881I$
$b = -1.15947 + 1.30344I$		
$u = 1.140593 + 0.644966I$		
$a = -0.71375 + 1.57989I$	$-0.13306 - 11.82354I$	$-11.00798 + 6.87881I$
$b = -1.15947 - 1.30344I$		
$u = 1.165049 - 0.599287I$		
$a = -0.835355 - 0.902162I$	$1.01444 + 7.41192I$	$-9.74429 - 9.04041I$
$b = -0.445675 + 1.208179I$		
$u = 1.165049 + 0.599287I$		
$a = -0.835355 + 0.902162I$	$1.01444 - 7.41192I$	$-9.74429 + 9.04041I$
$b = -0.445675 - 1.208179I$		
$u = 1.265290 - 0.064635I$		
$a = 0.069406 + 0.421777I$	$-6.23866 - 9.10516I$	$-17.0770 + 6.8244I$
$b = 1.110177 + 0.625972I$		
$u = 1.265290 + 0.064635I$		
$a = 0.069406 - 0.421777I$	$-6.23866 + 9.10516I$	$-17.0770 - 6.8244I$
$b = 1.110177 - 0.625972I$		

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_{10}	$(u^2 + u - 1)(u^{19} - u^{18} + \dots + 2u + 1)(u^{60} + 3u^{59} + \dots + 2u + 1)$
c_2	$(u^2 + 3u + 1)(u^{19} + 11u^{18} + \dots + 10u + 1)(u^{60} + 25u^{59} + \dots - 8u^2 + 1)$
c_3, c_5	$(u^2 - u - 1)(u^{19} - u^{18} + \dots + 2u + 1)(u^{60} + 3u^{59} + \dots + 2u + 1)$
c_4	$(4u^2 - 2u - 1)(4u^{19} + 6u^{18} + \dots + u - 1)(u^{60} + 9u^{59} + \dots - 2u + 49)$
c_6	$(u - 1)^2(u^{19} - u^{18} + \dots + 72u - 16)$ $(1 - 4u^2 + 4u^4 - 24u^5 - 32u^6 + 76u^7 + 150u^8 - 48u^9 - 240u^{10} - 44u^{11} + 146u^{12} - 40u^{13} - \dots)$
c_7	$u^2(u^{19} + 5u^{18} + \dots + 576u + 64)$ $(1 + 2u - 8u^2 + 6u^3 - 14u^4 + 4u^5 + 24u^6 - 38u^7 + 72u^8 - 34u^9 + 68u^{10} - 56u^{11} + 178u^{12} - \dots)$
c_8	$(u + 1)^2(u^{19} - u^{18} + \dots + 72u - 16)$ $(1 - 4u^2 + 4u^4 - 24u^5 - 32u^6 + 76u^7 + 150u^8 - 48u^9 - 240u^{10} - 44u^{11} + 146u^{12} - 40u^{13} - \dots)$
c_9	$(u^2 - 3u + 1)(u^{19} + 11u^{18} + \dots + 10u + 1)(u^{60} + 25u^{59} + \dots - 8u^2 + 1)$
c_{11}	$(4u^2 + 2u - 1)(4u^{19} + 6u^{18} + \dots + u - 1)(u^{60} + 9u^{59} + \dots - 2u + 49)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_5 c_{10}	$(y^2 - 3y + 1)(y^{19} - 11y^{18} + \dots + 10y - 1)(y^{60} - 25y^{59} + \dots - 8y^2 + 1)$
c_2, c_9	$(y^2 - 7y + 1)(y^{19} - 3y^{18} + \dots + 6y - 1)(y^{60} + 19y^{59} + \dots - 16y + 1)$
c_4	$(16y^2 - 12y + 1)(16y^{19} - 44y^{18} + \dots + 27y - 1)$ $(y^{60} + 15y^{59} + \dots + 225396y + 2401)$
c_6, c_8	$(y - 1)^2(y^{19} - 11y^{18} + \dots + 5152y - 256)$ $(1 - 8y + 24y^2 - 96y^3 + 572y^4 - 2512y^5 + 8084y^6 - 2.09 \times 10^4 y^7 + 4.52 \times 10^4 y^8 - 8.17 \times 10^4 y^9 + 1.48 \times 10^4 y^{10})$
c_7	$y^2(y^{19} + 3y^{18} + \dots + 84480y - 4096)$ $(1 - 20y + 12y^2 + 220y^3 + 60y^4 - 1112y^5 - 1236y^6 + 376y^7 + 686y^8 + 1548y^9 + 1.48 \times 10^4 y^{10})$
c_{11}	$(16y^2 - 12y + 1)(16y^{19} - 44y^{18} + \dots + 27y - 1)$ $(y^{60} + 15y^{59} + \dots + 225396y + 2401)$