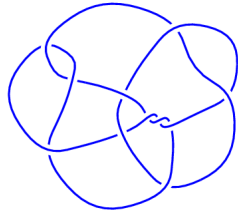
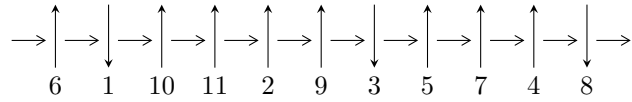


11a₁₂₉ (K11a₁₂₉)

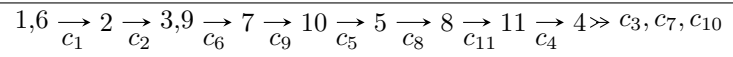


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = \bigcap_{i=1}^2 I_i^u$$

$$I_1^u = \langle u^3 + u^2 + 2u + 1, u^2 + a + u + 2, -u^2 + 7b + u - 4 \rangle$$

$$I_2^u = \langle u^{59} + 2u^{58} + \dots - 4u - 1, -1.91764 \times 10^{47}u^{58} - 4.02272 \times 10^{47}u^{57} + \dots + 2.17831 \times 10^{47}a + 8.99140 \times 10^{47}b - 7.86460 \times 10^{47}u^{58} - 8.24857 \times 10^{47}u^{57} + \dots + 1.52482 \times 10^{48}b - 1.10743 \times 10^{47} \rangle$$

There are 2 irreducible components with 62 representations.

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

$$\text{I. } I_1^u = \langle u^3 + u^2 + 2u + 1, u^2 + a + u + 2, -u^2 + 7b + u - 4 \rangle$$

(i) Arc colorings

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

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

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

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

$$a_9 = \begin{pmatrix} -u^2 - u - 2 \\ \frac{1}{7}u^2 - \frac{1}{7}u + \frac{4}{7} \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} -u \\ -u^2 - u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{4}{7}u^2 - \frac{3}{7}u - \frac{9}{7} \\ 0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

(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
$u = -0.569840$ $a = -1.75488$ $b = 0.699223$	2.75839	15.1893
$u = -0.215080 - 1.307141I$ $a = -0.122561 + 0.744862I$ $b = 0.364674 + 0.267060I$	$-1.37919 + 2.82812I$	$6.66044 + 5.49186I$
$u = -0.215080 + 1.307141I$ $a = -0.122561 - 0.744862I$ $b = 0.364674 - 0.267060I$	$-1.37919 - 2.82812I$	$6.66044 - 5.49186I$

$$\text{II. } I_2^u = \langle u^{59} + 2u^{58} + \dots - 4u - 1, -1.92 \times 10^{47} u^{58} - 4.02 \times 10^{47} u^{57} + \dots + 2.18 \times 10^{47} a + 8.99 \times 10^{47}, -7.86 \times 10^{47} u^{58} - 8.25 \times 10^{47} u^{57} + \dots + 1.52 \times 10^{48} b - 1.11 \times 10^{47} \rangle$$

(i) Arc colorings

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

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

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

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

$$a_9 = \begin{pmatrix} 0.880334u^{58} + 1.84672u^{57} + \dots - 1.19036u - 4.12769 \\ 0.515773u^{58} + 0.540954u^{57} + \dots + 0.869074u + 0.0726268 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.916403u^{58} + 1.87970u^{57} + \dots + 0.895810u - 4.08900 \\ 0.510090u^{58} + 0.540540u^{57} + \dots + 2.07311u + 0.157472 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.121237u^{58} - 0.128857u^{57} + \dots - 4.12161u - 0.0703064 \\ -0.00350111u^{58} - 0.0347593u^{57} + \dots - 1.30073u - 0.134750 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0.953991u^{58} + 1.59522u^{57} + \dots - 0.962582u - 3.72486 \\ 0.0272410u^{58} + 0.0233742u^{57} + \dots + 2.16287u + 0.0685969 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.134750u^{58} - 0.273000u^{57} + \dots + 1.08216u - 0.761734 \\ 0.113618u^{58} + 0.176695u^{57} + \dots - 0.555256u - 0.121237 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.247325u^{58} + 0.662742u^{57} + \dots - 1.63058u + 0.291658 \\ 0.168092u^{58} - 0.129263u^{57} + \dots + 1.28096u + 0.247325 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.247325u^{58} + 0.662742u^{57} + \dots - 1.63058u + 0.291658 \\ 0.168092u^{58} - 0.129263u^{57} + \dots + 1.28096u + 0.247325 \end{pmatrix}$$

(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
$u = -0.984441 - 0.529687I$ $a = 1.004843 - 0.635720I$ $b = -1.65051 - 0.69891I$	$5.85876 + 0.11889I$	$12.85983 - 0.52971I$
$u = -0.984441 + 0.529687I$ $a = 1.004843 + 0.635720I$ $b = -1.65051 + 0.69891I$	$5.85876 - 0.11889I$	$12.85983 + 0.52971I$
$u = -0.920445 - 0.536589I$ $a = 1.02151 - 1.08830I$ $b = -1.75834 - 0.64446I$	$13.4212 - 9.5497I$	$12.60640 + 3.95803I$
$u = -0.920445 + 0.536589I$ $a = 1.02151 + 1.08830I$ $b = -1.75834 + 0.64446I$	$13.4212 + 9.5497I$	$12.60640 - 3.95803I$
$u = -0.733377 - 1.128388I$ $a = 0.680742 - 0.713298I$ $b = -2.18758 - 0.58843I$	$4.02435 + 6.11409I$	$9.29108 - 4.87960I$
$u = -0.733377 + 1.128388I$ $a = 0.680742 + 0.713298I$ $b = -2.18758 + 0.58843I$	$4.02435 - 6.11409I$	$9.29108 + 4.87960I$
$u = -0.701304 - 1.111324I$ $a = 0.968507 - 0.757871I$ $b = -2.70525 - 0.68048I$	$11.6590 + 15.5089I$	$10.31782 - 8.13959I$
$u = -0.701304 + 1.111324I$ $a = 0.968507 + 0.757871I$ $b = -2.70525 + 0.68048I$	$11.6590 - 15.5089I$	$10.31782 + 8.13959I$
$u = -0.683737 - 0.607315I$ $a = 0.55812 + 1.37162I$ $b = 0.252187 - 0.820948I$	$7.23997 - 3.63562I$	$11.83171 + 2.99653I$
$u = -0.683737 + 0.607315I$ $a = 0.55812 - 1.37162I$ $b = 0.252187 + 0.820948I$	$7.23997 + 3.63562I$	$11.83171 - 2.99653I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.680135 - 0.786084I$ $a = -0.73044 + 1.69093I$ $b = 1.89769 + 0.12489I$	$11.01857 + 0.16153I$	$15.3579 - 0.6458I$
$u = -0.680135 + 0.786084I$ $a = -0.73044 - 1.69093I$ $b = 1.89769 - 0.12489I$	$11.01857 - 0.16153I$	$15.3579 + 0.6458I$
$u = -0.668786 - 0.902187I$ $a = -1.49378 + 0.80400I$ $b = 2.38866 + 0.90347I$	$10.66654 + 5.04841I$	$14.3676 - 5.7051I$
$u = -0.668786 + 0.902187I$ $a = -1.49378 - 0.80400I$ $b = 2.38866 - 0.90347I$	$10.66654 - 5.04841I$	$14.3676 + 5.7051I$
$u = -0.639166 - 1.007087I$ $a = -1.127879 - 0.474560I$ $b = 0.82739 + 1.19361I$	$6.06759 + 8.77463I$	$9.45253 - 7.92148I$
$u = -0.639166 + 1.007087I$ $a = -1.127879 + 0.474560I$ $b = 0.82739 - 1.19361I$	$6.06759 - 8.77463I$	$9.45253 + 7.92148I$
$u = -0.635747$ $a = 0.649289$ $b = -0.703411$	1.61678	5.27681
$u = -0.573063 - 0.858445I$ $a = -0.670149 + 0.872588I$ $b = 3.20509 + 1.62041I$	$2.15381 + 2.27881I$	$-7.94357 + 3.32360I$
$u = -0.573063 + 0.858445I$ $a = -0.670149 - 0.872588I$ $b = 3.20509 - 1.62041I$	$2.15381 - 2.27881I$	$-7.94357 - 3.32360I$
$u = -0.553519 - 0.993934I$ $a = -0.415620 - 0.151815I$ $b = 0.408476 - 0.170231I$	$-0.25044 + 3.21979I$	$3.90025 - 0.90131I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.553519 + 0.993934I$ $a = -0.415620 + 0.151815I$ $b = 0.408476 + 0.170231I$	$-0.25044 - 3.21979I$	$3.90025 + 0.90131I$
$u = -0.462195 - 0.671481I$ $a = -0.119813 + 0.606268I$ $b = -0.601427 - 0.188306I$	$0.818669 + 1.086875I$	$6.95263 - 5.92982I$
$u = -0.462195 + 0.671481I$ $a = -0.119813 - 0.606268I$ $b = -0.601427 + 0.188306I$	$0.818669 - 1.086875I$	$6.95263 + 5.92982I$
$u = -0.282031 - 1.157492I$ $a = 0.302609 - 0.470483I$ $b = -0.646754 - 0.400492I$	$-1.83113 + 3.37489I$	$-0.67684 - 6.31964I$
$u = -0.282031 + 1.157492I$ $a = 0.302609 + 0.470483I$ $b = -0.646754 + 0.400492I$	$-1.83113 - 3.37489I$	$-0.67684 + 6.31964I$
$u = -0.218983$ $a = -5.02750$ $b = -0.207976$	2.11871	0.678539
$u = -0.133043 - 0.520766I$ $a = -0.708635 + 0.999139I$ $b = -0.191283 - 0.635509I$	$0.674447 + 1.055544I$	$6.88917 - 6.16079I$
$u = -0.133043 + 0.520766I$ $a = -0.708635 - 0.999139I$ $b = -0.191283 + 0.635509I$	$0.674447 - 1.055544I$	$6.88917 + 6.16079I$
$u = -0.089273 - 1.378351I$ $a = 0.140713 - 0.801528I$ $b = -0.274085 - 0.302994I$	$-1.23742 + 3.26694I$	$11.3663 - 10.6974I$
$u = -0.089273 + 1.378351I$ $a = 0.140713 + 0.801528I$ $b = -0.274085 + 0.302994I$	$-1.23742 - 3.26694I$	$11.3663 + 10.6974I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.032617 - 0.990758I$ $a = 0.888441 - 0.029789I$ $b = -0.905148 - 0.901763I$	$2.38922 - 3.00723I$	$3.42401 + 2.53679I$
$u = -0.032617 + 0.990758I$ $a = 0.888441 + 0.029789I$ $b = -0.905148 + 0.901763I$	$2.38922 + 3.00723I$	$3.42401 - 2.53679I$
$u = 0.058861 - 1.275218I$ $a = -0.333588 - 1.017961I$ $b = 0.476010 + 0.072636I$	$6.48770 - 7.42956I$	$8.09632 + 5.49471I$
$u = 0.058861 + 1.275218I$ $a = -0.333588 + 1.017961I$ $b = 0.476010 - 0.072636I$	$6.48770 + 7.42956I$	$8.09632 - 5.49471I$
$u = 0.137524 - 1.027835I$ $a = -0.626107 - 0.222992I$ $b = 0.781828 - 0.617316I$	$-3.28171 + 0.39501I$	$-2.00061 - 1.54672I$
$u = 0.137524 + 1.027835I$ $a = -0.626107 + 0.222992I$ $b = 0.781828 + 0.617316I$	$-3.28171 - 0.39501I$	$-2.00061 + 1.54672I$
$u = 0.390405 - 0.817622I$ $a = 0.611929 + 0.822418I$ $b = 2.16734 - 1.76190I$	$6.34398 - 2.28663I$	$11.09109 - 4.75818I$
$u = 0.390405 + 0.817622I$ $a = 0.611929 - 0.822418I$ $b = 2.16734 + 1.76190I$	$6.34398 + 2.28663I$	$11.09109 + 4.75818I$
$u = 0.398582$ $a = 3.47163$ $b = 0.324585$	8.30655	10.7681
$u = 0.426307 - 0.460098I$ $a = 1.359150 + 0.181107I$ $b = 0.644001 - 0.367019I$	$6.50215 - 2.38989I$	$11.27204 + 2.30285I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.426307 + 0.460098I$ $a = 1.359150 - 0.181107I$ $b = 0.644001 + 0.367019I$	$6.50215 + 2.38989I$	$11.27204 - 2.30285I$
$u = 0.552687 - 0.945630I$ $a = 0.090574 + 0.320422I$ $b = -0.34144 - 1.82231I$	$5.48223 - 1.81992I$	$9.39092 + 3.32570I$
$u = 0.552687 + 0.945630I$ $a = 0.090574 - 0.320422I$ $b = -0.34144 + 1.82231I$	$5.48223 + 1.81992I$	$9.39092 - 3.32570I$
$u = 0.604324 - 0.573388I$ $a = -0.395116 + 0.973940I$ $b = 0.065984 - 0.490421I$	$0.92823 + 1.58622I$	$7.27802 - 5.02607I$
$u = 0.604324 + 0.573388I$ $a = -0.395116 - 0.973940I$ $b = 0.065984 + 0.490421I$	$0.92823 - 1.58622I$	$7.27802 + 5.02607I$
$u = 0.608030 - 1.009496I$ $a = 0.807649 - 0.370771I$ $b = -0.622216 + 0.676749I$	$-0.33205 - 6.44214I$	$4.62600 + 9.28024I$
$u = 0.608030 + 1.009496I$ $a = 0.807649 + 0.370771I$ $b = -0.622216 - 0.676749I$	$-0.33205 + 6.44214I$	$4.62600 - 9.28024I$
$u = 0.628580 - 0.787255I$ $a = 0.60556 + 1.31607I$ $b = -1.54203 + 0.70665I$	$4.05953 - 0.76565I$	$13.67462 - 0.08522I$
$u = 0.628580 + 0.787255I$ $a = 0.60556 - 1.31607I$ $b = -1.54203 - 0.70665I$	$4.05953 + 0.76565I$	$13.67462 + 0.08522I$
$u = 0.630391 - 0.897646I$ $a = 1.100086 + 0.718650I$ $b = -2.35260 + 0.70043I$	$3.71804 - 4.17211I$	$12.3249 + 7.4178I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.630391 + 0.897646I$ $a = 1.100086 - 0.718650I$ $b = -2.35260 - 0.70043I$	$3.71804 + 4.17211I$	$12.3249 - 7.4178I$
$u = 0.709501 - 1.162292I$ $a = -0.518508 - 0.861817I$ $b = 1.98938 - 0.21989I$	$10.90239 - 1.52833I$	$13.38061 + 1.32991I$
$u = 0.709501 + 1.162292I$ $a = -0.518508 + 0.861817I$ $b = 1.98938 + 0.21989I$	$10.90239 + 1.52833I$	$13.38061 - 1.32991I$
$u = 0.714424 - 1.111054I$ $a = -0.846597 - 0.704968I$ $b = 2.46864 - 0.69900I$	$4.44674 - 11.62550I$	$8.00562 + 8.71394I$
$u = 0.714424 + 1.111054I$ $a = -0.846597 + 0.704968I$ $b = 2.46864 + 0.69900I$	$4.44674 + 11.62550I$	$8.00562 - 8.71394I$
$u = 0.941643 - 0.550391I$ $a = -0.947634 - 0.890259I$ $b = 1.69875 - 0.66677I$	$6.17346 + 5.56581I$	$10.67180 - 4.54709I$
$u = 0.941643 + 0.550391I$ $a = -0.947634 + 0.890259I$ $b = 1.69875 + 0.66677I$	$6.17346 - 5.56581I$	$10.67180 + 4.54709I$
$u = 0.962528 - 0.479411I$ $a = -1.253286 - 0.475732I$ $b = 1.58637 - 0.78610I$	$12.98449 - 4.58039I$	$14.2893 + 3.5875I$
$u = 0.962528 + 0.479411I$ $a = -1.253286 + 0.475732I$ $b = 1.58637 + 0.78610I$	$12.98449 + 4.58039I$	$14.2893 - 3.5875I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^3 + u^2 + 2u + 1)(u^{59} + 2u^{58} + \dots - 4u - 1)$
c_2	$(u^3 + 3u^2 + 2u - 1)(u^{59} + 24u^{58} + \dots + 10u - 1)$
c_3, c_4	$(u^3 + u^2 - 1)(u^{59} + 2u^{58} + \dots + 5u^2 - 1)$
c_5	$(u^3 - u^2 + 2u - 1)(u^{59} + 2u^{58} + \dots - 4u - 1)$
c_6	$(u + 1)^3(u^{59} + 4u^{58} + \dots - 257u + 49)$
c_7	$(7u^3 + u^2 + u - 1)(7u^{59} + 22u^{58} + \dots - 126239u - 81841)$
c_8	$(7u^3 - u^2 - 4u - 1)(7u^{59} + 6u^{58} + \dots + 6234u - 1903)$
c_9	$(u - 1)^3(u^{59} + 4u^{58} + \dots - 257u + 49)$
c_{10}	$(u^3 - u^2 + 1)(u^{59} + 2u^{58} + \dots + 5u^2 - 1)$
c_{11}	$u^3(u^{59} + 5u^{58} + \dots - 868u + 392)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^3 + 3y^2 + 2y - 1)(y^{59} + 24y^{58} + \dots + 10y - 1)$
c_2	$(y^3 - 5y^2 + 10y - 1)(y^{59} + 24y^{58} + \dots + 462y - 1)$
c_3	$(y^3 - y^2 + 2y - 1)(y^{59} - 60y^{58} + \dots + 10y - 1)$
c_4	1.0000000000000000 $(1y^3 - y^2 + 2.0000000000000000y - 1.0000000000000000)$ $(1.00y^{59} - 60.0y^{58} + \dots + 10.0y - 1.00)$
c_6	$(y - 1)^3(y^{59} - 50y^{58} + \dots + 74183y - 2401)$
c_7	$(49y^3 + 13y^2 + 3y - 1)$ $(49y^{59} + 3394y^{58} + \dots - 90830373521y - 6697949281)$
c_8	$(49y^3 - 57y^2 + 14y - 1)$ $(49y^{59} - 64y^{58} + \dots + 229562386y - 3621409)$
c_9	$1.0000000000000000(1y - 1.0000000000000000)^3$ $(1.00y^{59} - 50.0y^{58} + \dots + 7.42 \times 10^4y - 2.40 \times 10^3)$
c_{10}	1.0000000000000000 $(1y^3 - y^2 + 2.0000000000000000y - 1.0000000000000000)$ $(1.00y^{59} - 60.0y^{58} + \dots + 10.0y - 1.00)$
c_{11}	$1y^3$ $(1.00y^{59} + 21.0y^{58} + \dots - 2.15 \times 10^6y - 1.54 \times 10^5)$