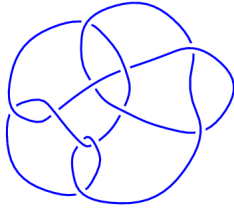
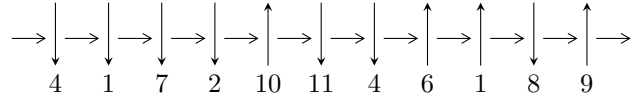


11n<sub>44</sub> (K11n<sub>44</sub>)

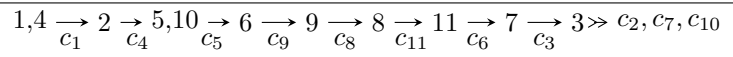


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

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

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

$$I_2^u = \langle b^5 + b^4 - 2b^3 - b^2 + b - 1, u - 1, -b + a - 1 \rangle$$

$$I_3^u = \langle u^{41} + 7u^{40} + \dots + 2u + 1, -4.55071 \times 10^{32}u^{40} - 3.04971 \times 10^{33}u^{39} + \dots + 3.54634 \times 10^{33}b + 1.97956 \times 10^{34} \\ - 1.27956 \times 10^{33}u^{40} - 7.27594 \times 10^{33}u^{39} + \dots + 3.54634 \times 10^{33}a - 1.00211 \times 10^{34} \rangle$$

There are 3 irreducible components with 49 representations.

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

$$\text{I. } \Gamma_1^u = \langle u^3 + u^2 - 1, b - 1, -2u^2 + a - 4u - 3 \rangle$$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} 2u^2 + 4u + 3 \\ 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 7u^2 + 11u + 9 \\ 2u^2 + 3u \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} 2u^2 + 4u + 3 \\ 1 \end{pmatrix}$$

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

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

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

(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
$u = -0.877439 - 0.744862I$ $a = -0.079596 - 0.365165I$ $b = 1.00000$	$4.66906 - 2.82812I$	$4.03193 - 6.06881I$
$u = -0.877439 + 0.744862I$ $a = -0.079596 + 0.365165I$ $b = 1.00000$	$4.66906 + 2.82812I$	$4.03193 + 6.06881I$
$u = 0.754878$ $a = 7.15919$ $b = 1.00000$	0.531480	84.9361

$$\text{II. } I_2^u = \langle b^5 + b^4 - 2b^3 - b^2 + b - 1, u - 1, -b + a - 1 \rangle$$

(i) Arc colorings

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

$$a_4 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} b+1 \\ b \end{pmatrix}$$

$$a_6 = \begin{pmatrix} b^2 + b - 1 \\ b^2 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0 \\ b^4 - b^3 - b^2 + 2b - 1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} 0 \\ b^4 - b^3 - b^2 + 2b - 1 \end{pmatrix}$$

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

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

(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
$u = 1.00000$ $a = -0.418784 - 0.219165I$ $b = -1.41878 - 0.21917I$	$4.22763 + 4.40083I$	$-8.55516 - 1.78781I$
$u = 1.00000$ $a = -0.418784 + 0.219165I$ $b = -1.41878 + 0.21917I$	$4.22763 - 4.40083I$	$-8.55516 + 1.78781I$
$u = 1.00000$ $a = 1.30992 - 0.54991I$ $b = 0.309916 - 0.549911I$	$-1.31583 - 1.53058I$	$-8.42731 + 4.45807I$
$u = 1.00000$ $a = 1.30992 + 0.54991I$ $b = 0.309916 + 0.549911I$	$-1.31583 + 1.53058I$	$-8.42731 - 4.45807I$
$u = 1.00000$ $a = 2.21774$ $b = 1.21774$	$0.756147$	$3.96494$

$$\text{III. } I_3^u = \langle u^{41} + 7u^{40} + \dots + 2u + 1, -4.55 \times 10^{32} u^{40} - 3.05 \times 10^{33} u^{39} + \dots + 3.55 \times 10^{33} b + 1.98 \times 10^{32}, -1.28 \times 10^{33} u^{40} - 7.28 \times 10^{33} u^{39} + \dots + 3.55 \times 10^{33} a - 1.00 \times 10^{34} \rangle$$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} 0.360812u^{40} + 2.05167u^{39} + \dots - 8.17453u + 2.82576 \\ 0.128321u^{40} + 0.859959u^{39} + \dots - 3.73417u - 0.0558198 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 2.57419u^{40} + 13.6219u^{39} + \dots - 13.2764u + 5.50487 \\ -0.824828u^{40} - 4.46073u^{39} + \dots - 3.42158u - 0.703781 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.232491u^{40} + 1.19171u^{39} + \dots - 4.44036u + 2.88158 \\ 0.128321u^{40} + 0.859959u^{39} + \dots - 3.73417u - 0.0558198 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1.89468u^{40} + 10.8589u^{39} + \dots - 3.67648u + 4.04534 \\ -0.427689u^{40} - 2.12225u^{39} + \dots - 3.33185u + 0.204351 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.101116u^{40} - 0.258346u^{39} + \dots + 7.23983u - 3.55682 \\ 0.153838u^{40} + 0.879491u^{39} + \dots + 4.81960u + 0.645350 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1.89468u^{40} + 10.8589u^{39} + \dots - 3.67648u + 4.04534 \\ -4.09416u^{40} - 22.1611u^{39} + \dots - 6.24482u - 2.19947 \end{pmatrix}$$

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

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

(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
$u = -1.68426 - 0.19522I$		
$a = 0.197462 + 0.763635I$	$-11.04374 - 1.47634I$	$-7.66064 - 1.60453I$
$b = 0.402639 + 0.808887I$		
$u = -1.68426 + 0.19522I$		
$a = 0.197462 - 0.763635I$	$-11.04374 + 1.47634I$	$-7.66064 + 1.60453I$
$b = 0.402639 - 0.808887I$		
$u = -1.61056 - 0.23381I$		
$a = 0.423955 + 1.249646I$	$-11.27278 - 7.05517I$	$-7.07836 + 4.93484I$
$b = 0.32746 + 1.40800I$		
$u = -1.61056 + 0.23381I$		
$a = 0.423955 - 1.249646I$	$-11.27278 + 7.05517I$	$-7.07836 - 4.93484I$
$b = 0.32746 - 1.40800I$		
$u = -1.58766 - 0.38818I$		
$a = 0.05254 - 1.45672I$	$-7.9395 - 14.4828I$	$-4.83661 + 7.30920I$
$b = 1.36138 - 0.75276I$		
$u = -1.58766 + 0.38818I$		
$a = 0.05254 + 1.45672I$	$-7.9395 + 14.4828I$	$-4.83661 - 7.30920I$
$b = 1.36138 + 0.75276I$		
$u = -1.56483 - 0.05519I$		
$a = 0.05994 + 1.52905I$	$-6.84034 - 1.09870I$	$-9.88199 - 5.22097I$
$b = -1.049241 + 0.368090I$		
$u = -1.56483 + 0.05519I$		
$a = 0.05994 - 1.52905I$	$-6.84034 + 1.09870I$	$-9.88199 + 5.22097I$
$b = -1.049241 - 0.368090I$		
$u = -1.53570 - 0.38602I$		
$a = -0.149350 - 1.179903I$	$-8.77885 - 6.88775I$	$-5.65103 + 4.66706I$
$b = 1.157159 - 0.624027I$		
$u = -1.53570 + 0.38602I$		
$a = -0.149350 + 1.179903I$	$-8.77885 + 6.88775I$	$-5.65103 - 4.66706I$
$b = 1.157159 + 0.624027I$		

Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.51445 - 0.11394I$ $a = -0.47763 + 1.44493I$ $b = -1.22246 + 1.14875I$	$-4.95010 - 4.48342I$	$-3.30708 + 5.30527I$
$u = -1.51445 + 0.11394I$ $a = -0.47763 - 1.44493I$ $b = -1.22246 - 1.14875I$	$-4.95010 + 4.48342I$	$-3.30708 - 5.30527I$
$u = -1.48400$ $a = -0.697477$ $b = -1.91952$	$-2.98279$	$-1.32719$
$u = -0.817513 - 0.853964I$ $a = -0.255534 - 0.434819I$ $b = 0.895543 - 0.128230I$	$4.46595 - 3.11596I$	$-9.1421 + 11.7493I$
$u = -0.817513 + 0.853964I$ $a = -0.255534 + 0.434819I$ $b = 0.895543 + 0.128230I$	$4.46595 + 3.11596I$	$-9.1421 - 11.7493I$
$u = -0.762796 - 0.059538I$ $a = 0.685914 - 0.388453I$ $b = 1.354297 - 0.223700I$	$4.65237 - 4.48889I$	$10.07507 + 5.98728I$
$u = -0.762796 + 0.059538I$ $a = 0.685914 + 0.388453I$ $b = 1.354297 + 0.223700I$	$4.65237 + 4.48889I$	$10.07507 - 5.98728I$
$u = -0.213366 - 0.037411I$ $a = -1.99525 - 2.11282I$ $b = -0.146268 - 0.552391I$	$0.05575 + 1.50352I$	$0.38191 - 4.17550I$
$u = -0.213366 + 0.037411I$ $a = -1.99525 + 2.11282I$ $b = -0.146268 + 0.552391I$	$0.05575 - 1.50352I$	$0.38191 + 4.17550I$
$u = 0.059485 - 0.186213I$ $a = 2.78956 + 5.11758I$ $b = -1.278259 + 0.126441I$	$2.56340 - 0.10081I$	$4.27921 - 2.25595I$



Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.059485 + 0.186213I$ $a = 2.78956 - 5.11758I$ $b = -1.278259 - 0.126441I$	$2.56340 + 0.10081I$	$4.27921 + 2.25595I$
$u = 0.380775 - 0.454242I$ $a = 0.670485 + 0.032746I$ $b = -1.007361 - 0.614689I$	$1.43126 + 2.56358I$	$1.01752 - 7.87421I$
$u = 0.380775 + 0.454242I$ $a = 0.670485 - 0.032746I$ $b = -1.007361 + 0.614689I$	$1.43126 - 2.56358I$	$1.01752 + 7.87421I$
$u = 0.387590 - 0.911908I$ $a = -0.971331 + 0.325235I$ $b = 0.764541 + 0.597354I$	$-2.61027 + 2.03740I$	$-5.72892 - 3.65159I$
$u = 0.387590 + 0.911908I$ $a = -0.971331 - 0.325235I$ $b = 0.764541 - 0.597354I$	$-2.61027 - 2.03740I$	$-5.72892 + 3.65159I$
$u = 0.508644 - 1.042803I$ $a = -0.681098 + 0.649137I$ $b = 1.178244 + 0.659530I$	$-1.17487 + 9.23550I$	$-3.04368 - 7.03311I$
$u = 0.508644 + 1.042803I$ $a = -0.681098 - 0.649137I$ $b = 1.178244 - 0.659530I$	$-1.17487 - 9.23550I$	$-3.04368 + 7.03311I$
$u = 0.612280 - 0.220916I$ $a = -0.42857 - 4.33330I$ $b = -0.908176 + 0.005657I$	$0.484163 + 0.158339I$	$13.38590 - 1.00156I$
$u = 0.612280 + 0.220916I$ $a = -0.42857 + 4.33330I$ $b = -0.908176 - 0.005657I$	$0.484163 - 0.158339I$	$13.38590 + 1.00156I$
$u = 0.695393 - 0.752192I$ $a = -0.0733729 - 0.1016162I$ $b = 0.382217 - 0.951284I$	$-3.58550 + 3.36599I$	$-6.85826 - 4.39505I$

Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.695393 + 0.752192I$ $a = -0.0733729 + 0.1016162I$ $b = 0.382217 + 0.951284I$	$-3.58550 - 3.36599I$	$-6.85826 + 4.39505I$
$u = 0.737003$ $a = -0.918962$ $b = 0.00861004$	$-1.10369$	$-8.82467$
$u = 0.858145 - 0.924978I$ $a = -0.0136488 + 0.1120601I$ $b = 0.908643 - 0.588751I$	$-2.16828 - 2.66511I$	$-5.14222 + 3.41368I$
$u = 0.858145 + 0.924978I$ $a = -0.0136488 - 0.1120601I$ $b = 0.908643 + 0.588751I$	$-2.16828 + 2.66511I$	$-5.14222 - 3.41368I$
$u = 0.883212$ $a = -5.41324$ $b = -1.04711$	$0.458131$	$-57.1146$
$u = 1.149305 - 0.071261I$ $a = -2.67006 - 0.97064I$ $b = -0.783716 - 0.351647I$	$-0.578838 + 1.255807I$	$2.38019 + 0.06658I$
$u = 1.149305 + 0.071261I$ $a = -2.67006 + 0.97064I$ $b = -0.783716 + 0.351647I$	$-0.578838 - 1.255807I$	$2.38019 - 0.06658I$
$u = 1.46523 - 0.11671I$ $a = -0.138455 + 1.392323I$ $b = 0.596164 + 0.809978I$	$-5.33009 - 0.54259I$	$-7.21463 + 0.52853I$
$u = 1.46523 + 0.11671I$ $a = -0.138455 - 1.392323I$ $b = 0.596164 - 0.809978I$	$-5.33009 + 0.54259I$	$-7.21463 - 0.52853I$
$u = 1.60618 - 0.13682I$ $a = 0.489280 + 1.112378I$ $b = 1.046201 + 0.671367I$	$-3.96071 + 6.10430I$	$-4.84103 - 5.05221I$
Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.60618 + 0.13682I$ $a = 0.489280 - 1.112378I$ $b = 1.046201 - 0.671367I$	$-3.96071 - 6.10430I$	$-4.84103 + 5.05221I$

#### IV. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u-1)^5(u^3+u^2-1)(u^{41}+7u^{40}+\dots+2u+1)$
$c_2$	$(u+1)^5(u^3+u^2+2u+1)(u^{41}+43u^{40}+\dots+12u+1)$
$c_3$	$u^5(u^3-u^2+2u-1)(u^{41}+2u^{40}+\dots+96u+32)$
$c_4$	$(u+1)^5(u^3-u^2+1)(u^{41}+7u^{40}+\dots+2u+1)$
$c_5$	$(u^3+2u^2-3u+1)(u^5-u^4-2u^3+u^2+u+1)$ $(u^{41}+16u^{39}+\dots-1085u-79)$
$c_6$	$(u^3+2u^2-3u+1)(u^5+u^4+2u^3+u^2+u+1)$ $(u^{41}+4u^{40}+\dots-237u+191)$
$c_7$	$u^5(u^3+u^2+2u+1)(u^{41}+2u^{40}+\dots+96u+32)$
$c_8$	$(u^3-3u^2+2u+1)(u^5-3u^4+4u^3-u^2-u+1)$ $(u^{41}+3u^{40}+\dots-2u-1)$
$c_9$	$(u+1)^3(u^5-u^4+\dots+u+1)(u^{41}+5u^{40}+\dots+119u+1)$
$c_{10}$	$u^3(u^5-u^4+\dots+u-1)(u^{41}+6u^{40}+\dots+156u+8)$
$c_{11}$	$(u-1)^3(u^5+u^4+\dots+u-1)(u^{41}+5u^{40}+\dots+119u+1)$

## V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_4$	$(y - 1)^5(y^3 - y^2 + 2y - 1)(y^{41} - 43y^{40} + \dots + 12y - 1)$
$c_2$	$(y - 1)^5(y^3 + 3y^2 + 2y - 1)(y^{41} - 83y^{40} + \dots + 1144y - 1)$
$c_3, c_7$	$y^5(y^3 + 3y^2 + 2y - 1)(y^{41} - 30y^{40} + \dots + 3584y - 1024)$
$c_5$	$(y^3 - 10y^2 + 5y - 1)(y^5 - 5y^4 + 8y^3 - 3y^2 - y - 1)$ $(y^{41} + 32y^{40} + \dots + 183721y - 6241)$
$c_6$	$(y^3 - 10y^2 + 5y - 1)(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)$ $(y^{41} + 8y^{40} + \dots + 999709y - 36481)$
$c_8$	$(y^3 - 5y^2 + 10y - 1)(y^5 - y^4 + 8y^3 - 3y^2 + 3y - 1)$ $(y^{41} - 11y^{40} + \dots + 26y - 1)$
$c_9, c_{11}$	$(y - 1)^3(y^5 - 5y^4 + \dots - y - 1)(y^{41} - 21y^{40} + \dots + 13495y - 1)$
$c_{10}$	$y^3(y^5 + 3y^4 + \dots - y - 1)(y^{41} - 18y^{40} + \dots + 7824y - 64)$