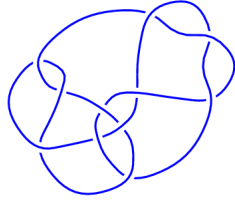
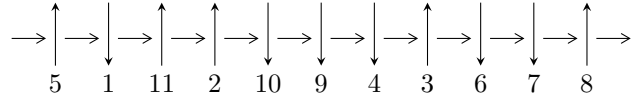


11a<sub>69</sub> (K11a<sub>69</sub>)

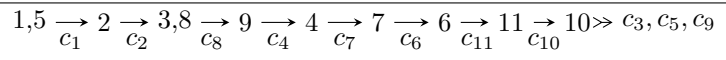


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

$$I = I_1^u$$

$$I_1^u = \langle u^{70} - u^{69} + \dots - 7u + 1, 6.82950 \times 10^{70}u^{69} - 1.52385 \times 10^{70}u^{68} + \dots + 6.61166 \times 10^{70}a + 3.61726 \times 10^{71}, \\ - 1.32395 \times 10^{70}u^{69} + 4.90259 \times 10^{70}u^{68} + \dots + 6.61166 \times 10^{70}b + 4.90917 \times 10^{70} \rangle$$

There are 1 irreducible components with 70 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>”

$$I_1^u = \langle u^{70} - u^{69} + \dots - 7u + 1, \overset{\mathbf{I.}}{6.83 \times 10^{70} u^{69} - 1.52 \times 10^{70} u^{68} + \dots + 6.61 \times 10^{70} a + 3.62 \times 10^{71}, -1.32 \times 10^{70} u^{69} + 4.90 \times 10^{70} u^{68} + \dots + 6.61 \times 10^{70} b + 4.91 \times 10^{70}} \rangle$$

(i) Arc colorings

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

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

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

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

$$a_8 = \begin{pmatrix} -1.03295u^{69} + 0.230480u^{68} + \dots + 12.8135u - 5.47103 \\ 0.200245u^{69} - 0.741507u^{68} + \dots + 7.88951u - 0.742501 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.218838u^{69} - 0.721185u^{68} + \dots + 16.3322u - 5.53922 \\ -0.568243u^{69} + 0.396283u^{68} + \dots + 3.68684u - 0.0730781 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -0.351653u^{69} - 0.0562920u^{68} + \dots + 9.51195u - 4.96448 \\ -0.652628u^{69} + 0.0138570u^{68} + \dots + 9.11067u - 0.854526 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.561639u^{69} - 1.06041u^{68} + \dots + 7.46541u - 2.71413 \\ -0.475520u^{69} + 0.477952u^{68} + \dots - 3.57338u + 0.825199 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.539784u^{69} + 0.407632u^{68} + \dots - 21.4593u + 3.02626 \\ 0.132152u^{69} + 0.189434u^{68} + \dots + 0.752232u - 0.539784 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.770820u^{69} + 0.798589u^{68} + \dots - 13.0113u + 4.13938 \\ 0.412590u^{69} - 0.332882u^{68} + \dots + 0.316261u - 0.240663 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.770820u^{69} + 0.798589u^{68} + \dots - 13.0113u + 4.13938 \\ 0.412590u^{69} - 0.332882u^{68} + \dots + 0.316261u - 0.240663 \end{pmatrix}$$

(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
$u = -1.003967 - 0.281861I$ $a = -0.603104 - 0.049560I$ $b = 0.756164 + 0.054992I$	$6.67319 - 1.90375I$	$10.82437 + 0.84693I$
$u = -1.003967 + 0.281861I$ $a = -0.603104 + 0.049560I$ $b = 0.756164 - 0.054992I$	$6.67319 + 1.90375I$	$10.82437 - 0.84693I$
$u = -1.001640 - 0.651261I$ $a = 0.718177 - 0.020199I$ $b = -0.739049 - 0.145003I$	$6.29345 + 5.42481I$	$9.42014 - 7.24239I$
$u = -1.001640 + 0.651261I$ $a = 0.718177 + 0.020199I$ $b = -0.739049 + 0.145003I$	$6.29345 - 5.42481I$	$9.42014 + 7.24239I$
$u = -0.838536 - 0.993294I$ $a = 0.758362 - 0.266685I$ $b = -0.676531 - 0.281724I$	$5.26003 + 1.16982I$	$7.23729 - 4.39808I$
$u = -0.838536 + 0.993294I$ $a = 0.758362 + 0.266685I$ $b = -0.676531 + 0.281724I$	$5.26003 - 1.16982I$	$7.23729 + 4.39808I$
$u = -0.833768 - 0.669179I$ $a = -0.825160 - 0.019096I$ $b = 0.684395 + 0.137169I$	$1.32084 + 2.75218I$	$4.00267 - 8.42337I$
$u = -0.833768 + 0.669179I$ $a = -0.825160 + 0.019096I$ $b = 0.684395 - 0.137169I$	$1.32084 - 2.75218I$	$4.00267 + 8.42337I$
$u = -0.728444 - 0.317658I$ $a = 0.577971 + 0.204619I$ $b = -0.704091 - 0.047297I$	$1.64058 + 0.33786I$	$6.07692 + 1.73353I$
$u = -0.728444 + 0.317658I$ $a = 0.577971 - 0.204619I$ $b = -0.704091 + 0.047297I$	$1.64058 - 0.33786I$	$6.07692 - 1.73353I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.693479 - 1.215560I$ $a = -0.567968 + 0.412304I$ $b = 0.668101 + 0.423676I$	$3.90043 + 8.04691I$	$3.82020 - 10.58986I$
$u = -0.693479 + 1.215560I$ $a = -0.567968 - 0.412304I$ $b = 0.668101 - 0.423676I$	$3.90043 - 8.04691I$	$3.82020 + 10.58986I$
$u = -0.616639 - 1.172648I$ $a = 0.565812 - 0.505437I$ $b = -0.617845 - 0.438744I$	$-0.93135 + 4.88535I$	$-2.28013 - 10.40687I$
$u = -0.616639 + 1.172648I$ $a = 0.565812 + 0.505437I$ $b = -0.617845 + 0.438744I$	$-0.93135 - 4.88535I$	$-2.28013 + 10.40687I$
$u = -0.612892 - 0.951335I$ $a = -1.008808 + 0.587650I$ $b = 0.515214 + 0.290990I$	$0.54295 + 2.64582I$	$2.44579 - 0.83594I$
$u = -0.612892 + 0.951335I$ $a = -1.008808 - 0.587650I$ $b = 0.515214 - 0.290990I$	$0.54295 - 2.64582I$	$2.44579 + 0.83594I$
$u = -0.541955 - 0.776960I$ $a = 0.63182 + 2.26229I$ $b = -0.059607 + 0.520507I$	$3.56607 - 0.95896I$	$-11.21360 - 3.18554I$
$u = -0.541955 + 0.776960I$ $a = 0.63182 - 2.26229I$ $b = -0.059607 - 0.520507I$	$3.56607 + 0.95896I$	$-11.21360 + 3.18554I$
$u = -0.536274 - 0.919865I$ $a = -1.37304 - 2.08210I$ $b = 0.284130 - 0.399162I$	$3.11019 + 5.29914I$	$-3.0401 + 15.5285I$
$u = -0.536274 + 0.919865I$ $a = -1.37304 + 2.08210I$ $b = 0.284130 + 0.399162I$	$3.11019 - 5.29914I$	$-3.0401 - 15.5285I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.485312 - 0.908136I$ $a = 1.78720 + 1.87066I$ $b = -0.341793 + 0.291449I$	$-1.29895 + 2.30609I$	$11.5630 + 16.8929I$
$u = -0.485312 + 0.908136I$ $a = 1.78720 - 1.87066I$ $b = -0.341793 - 0.291449I$	$-1.29895 - 2.30609I$	$11.5630 - 16.8929I$
$u = -0.437497 - 0.816872I$ $a = -0.14154 - 2.07415I$ $b = -0.101470 - 0.501644I$	$-0.93813 + 1.54075I$	$-3.94589 - 11.49495I$
$u = -0.437497 + 0.816872I$ $a = -0.14154 + 2.07415I$ $b = -0.101470 + 0.501644I$	$-0.93813 - 1.54075I$	$-3.94589 + 11.49495I$
$u = -0.416221 - 1.189184I$ $a = -0.313235 + 0.632253I$ $b = 0.555488 + 0.566144I$	$1.99705 + 2.44523I$	$0.42203 - 5.58212I$
$u = -0.416221 + 1.189184I$ $a = -0.313235 - 0.632253I$ $b = 0.555488 - 0.566144I$	$1.99705 - 2.44523I$	$0.42203 + 5.58212I$
$u = -0.401964 - 0.917807I$ $a = -1.57399 - 1.40654I$ $b = 0.505018 - 0.276523I$	$2.39518 - 0.54119I$	$8.37251 + 3.42089I$
$u = -0.401964 + 0.917807I$ $a = -1.57399 + 1.40654I$ $b = 0.505018 + 0.276523I$	$2.39518 + 0.54119I$	$8.37251 - 3.42089I$
$u = -0.250675 - 0.338013I$ $a = 1.35492 + 2.51441I$ $b = -0.051209 + 0.692143I$	$3.63488 + 3.48634I$	$-1.23972 - 4.18650I$
$u = -0.250675 + 0.338013I$ $a = 1.35492 - 2.51441I$ $b = -0.051209 - 0.692143I$	$3.63488 - 3.48634I$	$-1.23972 + 4.18650I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.006202 - 1.312425I$		
$a = -0.087110 - 0.263404I$	$-1.19896 + 8.13596I$	$-2.64385 - 7.58232I$
$b = -0.641500 - 0.851768I$		
$u = -0.006202 + 1.312425I$		
$a = -0.087110 + 0.263404I$	$-1.19896 - 8.13596I$	$-2.64385 + 7.58232I$
$b = -0.641500 + 0.851768I$		
$u = 0.050089 - 1.257285I$		
$a = 0.182007 + 0.232896I$	$-5.92974 + 4.34707I$	$-7.96325 - 5.56332I$
$b = 0.619110 + 0.903635I$		
$u = 0.050089 + 1.257285I$		
$a = 0.182007 - 0.232896I$	$-5.92974 - 4.34707I$	$-7.96325 + 5.56332I$
$b = 0.619110 - 0.903635I$		
$u = 0.140513 - 1.175145I$		
$a = -0.344278 - 0.143372I$	$-3.16104 + 0.50300I$	$-5.18092 - 0.50402I$
$b = -0.591502 - 1.001911I$		
$u = 0.140513 + 1.175145I$		
$a = -0.344278 + 0.143372I$	$-3.16104 - 0.50300I$	$-5.18092 + 0.50402I$
$b = -0.591502 + 1.001911I$		
$u = 0.224664 - 0.169997I$		
$a = -3.33119 + 0.02340I$	$-1.37636 + 0.69918I$	$-5.13733 - 2.33652I$
$b = 0.423967 - 0.698653I$		
$u = 0.224664 + 0.169997I$		
$a = -3.33119 - 0.02340I$	$-1.37636 - 0.69918I$	$-5.13733 + 2.33652I$
$b = 0.423967 + 0.698653I$		
$u = 0.254902 - 0.847557I$		
$a = 1.39483 + 1.45213I$	$0.95320 + 3.02207I$	$-3.51437 - 4.78633I$
$b = -1.293790 + 0.202808I$		
$u = 0.254902 + 0.847557I$		
$a = 1.39483 - 1.45213I$	$0.95320 - 3.02207I$	$-3.51437 + 4.78633I$
$b = -1.293790 - 0.202808I$		

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.297139 - 0.882531I$ $a = -1.170542 + 0.067964I$ $b = -0.282271 - 1.384166I$	$-1.94107 + 0.75277I$	$-7.49106 - 4.95501I$
$u = 0.297139 + 0.882531I$ $a = -1.170542 - 0.067964I$ $b = -0.282271 + 1.384166I$	$-1.94107 - 0.75277I$	$-7.49106 + 4.95501I$
$u = 0.406148 - 0.936613I$ $a = -1.69854 - 1.42899I$ $b = 1.62427 - 0.57750I$	$-3.33093 - 1.52607I$	$-13.07472 + 1.31899I$
$u = 0.406148 + 0.936613I$ $a = -1.69854 + 1.42899I$ $b = 1.62427 + 0.57750I$	$-3.33093 + 1.52607I$	$-13.07472 - 1.31899I$
$u = 0.469428 - 0.973496I$ $a = 0.697160 - 0.881105I$ $b = 0.87580 + 1.58062I$	$-2.85780 - 3.99529I$	$-10.44720 + 9.33363I$
$u = 0.469428 + 0.973496I$ $a = 0.697160 + 0.881105I$ $b = 0.87580 - 1.58062I$	$-2.85780 + 3.99529I$	$-10.44720 - 9.33363I$
$u = 0.489406 - 0.250651I$ $a = 1.71867 + 1.21428I$ $b = -0.900665 - 0.606704I$	$1.23691 + 2.50489I$	$0.44486 - 4.33475I$
$u = 0.489406 + 0.250651I$ $a = 1.71867 - 1.21428I$ $b = -0.900665 + 0.606704I$	$1.23691 - 2.50489I$	$0.44486 + 4.33475I$
$u = 0.507327 - 1.004447I$ $a = 1.83109 + 1.07834I$ $b = -1.45077 + 0.97835I$	$-0.50648 - 6.46270I$	$-4.51731 + 10.80382I$
$u = 0.507327 + 1.004447I$ $a = 1.83109 - 1.07834I$ $b = -1.45077 - 0.97835I$	$-0.50648 + 6.46270I$	$-4.51731 - 10.80382I$

Solution to $I_1^\mu$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.519294 - 0.588568I$ $a = 1.96772 + 0.12778I$ $b = -0.555679 + 1.264555I$	$4.08495 + 3.81337I$	$3.16539 - 5.10767I$
$u = 0.519294 + 0.588568I$ $a = 1.96772 - 0.12778I$ $b = -0.555679 - 1.264555I$	$4.08495 - 3.81337I$	$3.16539 + 5.10767I$
$u = 0.558838 - 0.987517I$ $a = -0.236110 + 1.031567I$ $b = -1.12142 - 1.39774I$	$2.91206 - 8.27553I$	$0.02494 + 11.22505I$
$u = 0.558838 + 0.987517I$ $a = -0.236110 - 1.031567I$ $b = -1.12142 + 1.39774I$	$2.91206 + 8.27553I$	$0.02494 - 11.22505I$
$u = 0.620167 - 1.091347I$ $a = 1.67136 + 0.83458I$ $b = -1.20512 + 1.04362I$	$0.05172 - 8.00134I$	$-0.93933 + 5.30903I$
$u = 0.620167 + 1.091347I$ $a = 1.67136 - 0.83458I$ $b = -1.20512 - 1.04362I$	$0.05172 + 8.00134I$	$-0.93933 - 5.30903I$
$u = 0.652177 - 1.126721I$ $a = -1.61508 - 0.80014I$ $b = 1.15985 - 1.03785I$	$-1.87843 - 12.59620I$	$-3.11036 + 9.02697I$
$u = 0.652177 + 1.126721I$ $a = -1.61508 + 0.80014I$ $b = 1.15985 + 1.03785I$	$-1.87843 + 12.59620I$	$-3.11036 - 9.02697I$
$u = 0.667838 - 0.997816I$ $a = -1.78911 - 0.70363I$ $b = 1.19304 - 1.16811I$	$8.13804 - 7.06461I$	$4.91208 + 7.07377I$
$u = 0.667838 + 0.997816I$ $a = -1.78911 + 0.70363I$ $b = 1.19304 + 1.16811I$	$8.13804 + 7.06461I$	$4.91208 - 7.07377I$



Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.680160 - 1.138337I$ $a = 1.59303 + 0.77025I$ $b = -1.13723 + 1.04455I$	$3.4715 - 16.7403I$	$1.05963 + 9.75592I$
$u = 0.680160 + 1.138337I$ $a = 1.59303 - 0.77025I$ $b = -1.13723 - 1.04455I$	$3.4715 + 16.7403I$	$1.05963 - 9.75592I$
$u = 0.768228 - 0.457281I$ $a = 1.20536 + 0.95025I$ $b = -1.095519 - 0.786479I$	$1.92693 + 2.73519I$	$2.12851 - 1.17713I$
$u = 0.768228 + 0.457281I$ $a = 1.20536 - 0.95025I$ $b = -1.095519 + 0.786479I$	$1.92693 - 2.73519I$	$2.12851 + 1.17713I$
$u = 0.776577 - 0.650017I$ $a = -0.922024 - 1.023180I$ $b = 1.20743 + 0.85684I$	$9.19605 + 1.61168I$	$6.97481 - 1.32865I$
$u = 0.776577 + 0.650017I$ $a = -0.922024 + 1.023180I$ $b = 1.20743 - 0.85684I$	$9.19605 - 1.61168I$	$6.97481 + 1.32865I$
$u = 0.884444 - 0.447119I$ $a = -1.157764 - 0.800837I$ $b = 1.076266 + 0.846603I$	$0.17592 + 6.93073I$	$-0.67959 - 5.56176I$
$u = 0.884444 + 0.447119I$ $a = -1.157764 + 0.800837I$ $b = 1.076266 - 0.846603I$	$0.17592 - 6.93073I$	$-0.67959 + 5.56176I$
$u = 0.938125 - 0.475226I$ $a = 1.103093 + 0.752114I$ $b = -1.081183 - 0.871713I$	$5.50503 + 10.82286I$	$3.52361 - 6.15835I$
$u = 0.938125 + 0.475226I$ $a = 1.103093 - 0.752114I$ $b = -1.081183 + 0.871713I$	$5.50503 - 10.82286I$	$3.52361 + 6.15835I$

## II. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1, c_4$	$(u^{70} + u^{69} + \dots + 7u + 1)$
$c_2$	$(u^{70} + 29u^{69} + \dots + 7u + 1)$
$c_3$	$(u^{70} + 7u^{69} + \dots + u + 1)$
$c_5, c_6$	$(u^{70} + u^{69} + \dots + 5u + 1)$
$c_7$	$(u^{70} + 3u^{69} + \dots - 23u + 1)$
$c_8$	$(u^{70} + u^{69} + \dots + 49u + 4)$
$c_9$	$(u^{70} + u^{69} + \dots + 5u + 1)$
$c_{10}$	$(u^{70} + u^{69} + \dots - 1887u + 578)$
$c_{11}$	$(u^{70} + 5u^{69} + \dots + u + 1)$

### III. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_4$	$(y^{70} + 29y^{69} + \dots + 7y + 1)$
$c_2$	$(y^{70} + 25y^{69} + \dots + 347y + 1)$
$c_3$	$(y^{70} + 5y^{69} + \dots + 7y + 1)$
$c_5$	$(y^{70} + 61y^{69} + \dots - 5y + 1)$
$c_6, c_9$	$(y^{70} + 61y^{69} + \dots - 5y + 1)$
$c_7$	$(y^{70} - 71y^{69} + \dots - 45y + 1)$
$c_8$	$(y^{70} - 75y^{69} + \dots - 401y + 16)$
$c_{10}$	$(y^{70} - 15y^{69} + \dots - 869601y + 334084)$
$c_{11}$	$(y^{70} - 7y^{69} + \dots - 5y + 1)$