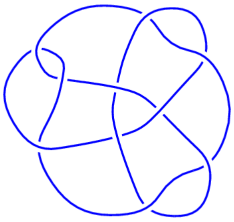
10_{101} $(K10a_{45})$



[1]

Arc Sequences

$$\rightarrow\downarrow_{6}\rightarrow\downarrow_{9}\rightarrow\downarrow_{7}\rightarrow\downarrow_{10}\rightarrow\downarrow_{3}\rightarrow\downarrow_{1}\rightarrow\downarrow_{5}\rightarrow\downarrow_{2}\rightarrow\downarrow_{8}\rightarrow\downarrow_{4}\rightarrow$$

Solving Sequence

$$2,9 \xrightarrow[c_2]{} 3,6 \xrightarrow[c_1]{} 1 \xrightarrow[c_6]{} 7 \xrightarrow[c_3]{} 4 \xrightarrow[c_5]{} 5 \xrightarrow[c_8]{} 8 \xrightarrow[c_{10}]{} 10 \twoheadrightarrow c_4, c_7, c_9$$

Representation Ideals

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

$$I_1^u = \langle u^7 + 4u^5 + u^4 + 6u^3 + 2u^2 + 4u + 1,\ u^4 + 2u^2 + b + u + 1,\ -u^6 + u^5 - 5u^4 + 2u^3 - 8u^2 + a + u - 5\rangle$$

$$I_2^u = \langle u^{17} + 7u^{15} - u^{14} + 20u^{13} - 6u^{12} + 25u^{11} - 13u^{10} + 6u^9 - 9u^8 - 13u^7 + 5u^6 - 6u^5 + 4u^4 + 4u^3 - 3u^2 + u +$$
$$63u^{16} + 182u^{15} + \cdots + 709b + 60,\ -340u^{16} - 352u^{15} + \cdots + 709a - 155\rangle$$

$$I_3^u = \langle u^{32} + u^{31} + \cdots - 10u + 1,\ -3.25121 \times 10^{31}u^{31} - 2.95916 \times 10^{31}u^{30} + \cdots + 1.18669 \times 10^{33}b - 1.77451 \times 10$$
$$- 4.58489 \times 10^{32}u^{31} - 2.42805 \times 10^{32}u^{30} + \cdots + 1.18669 \times 10^{33}a - 1.07104 \times 10^{33}\rangle$$

There are 3 irreducible components with 56 representations.

[1]The knot diagram image is adapter from "C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, http://www.indiana.edu/ knotinfo"

I. $\boldsymbol{I_1^u = \langle u^7 + 4u^5 + u^4 + 6u^3 + 2u^2 + 4u + 1,\ u^4 + 2u^2 + b + u + 1,\ -u^6 + u^5 - 5u^4 + 2u^3 - 8u^2 + a + u - 5\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^6 - u^5 + 5u^4 - 2u^3 + 8u^2 - u + 5 \\ -u^4 - 2u^2 - u - 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^6 - 4u^4 - u^3 - 6u^2 - u - 4 \\ u^5 + 2u^3 + u^2 + u + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^6 + u^5 - 4u^4 + 2u^3 - 5u^2 + 2u - 3 \\ u^5 + 2u^3 + u^2 + 2u + 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^6 - 4u^4 - 6u^2 - 4 \\ -u^5 - 3u^3 - 2u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^6 - u^5 + 4u^4 - 2u^3 + 6u^2 - 2u + 4 \\ -u^4 - 2u^2 - u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^6 + 3u^4 + u^3 + 4u^2 + u + 2 \\ u^6 + 2u^4 + u^3 + u^2 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3u^6 + 2u^5 - 11u^4 - 12u^2 - 4u - 11$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.435000 - 0.985366I$ $a = -1.29482 + 0.58387I$ $b = \quad 1.122263 + 0.611121I$	$3.17738 - 5.75449I$	$-4.78830 + 6.98275I$
$u = -0.435000 + 0.985366I$ $a = -1.29482 - 0.58387I$ $b = \quad 1.122263 - 0.611121I$	$3.17738 + 5.75449I$	$-4.78830 - 6.98275I$
$u = -0.257491$ $a = \quad 5.84545$ $b = -0.879508$	-3.03629	-10.8171
$u = \quad 0.128247 - 1.380362I$ $a = \quad 0.118462 + 0.946967I$ $b = -0.793128 + 0.750889I$	$6.43224 + 2.89342I$	$-4.05142 - 2.86813I$
$u = \quad 0.128247 + 1.380362I$ $a = \quad 0.118462 - 0.946967I$ $b = -0.793128 - 0.750889I$	$6.43224 - 2.89342I$	$-4.05142 + 2.86813I$
$u = \quad 0.435499 - 1.245847I$ $a = -0.746367 - 0.307664I$ $b = \quad 0.610619 + 0.459179I$	$5.06800 + 1.30245I$	$-2.75170 + 0.65887I$
$u = \quad 0.435499 + 1.245847I$ $a = -0.746367 + 0.307664I$ $b = \quad 0.610619 - 0.459179I$	$5.06800 - 1.30245I$	$-2.75170 - 0.65887I$

II. $I_2^u = \langle u^{17} + 7u^{15} + \cdots + u + 1,\ 63u^{16} + 182u^{15} + \cdots + 709b + 60,\ -340u^{16} - 352u^{15} + \cdots + 709a - 155 \rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.479549u^{16} + 0.496474u^{15} + \cdots - 0.513399u + 0.218618 \\ -0.0888575u^{16} - 0.256700u^{15} + \cdots + 0.424542u - 0.0846262 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.550071u^{16} - 0.0775740u^{15} + \cdots - 1.29478u - 0.190409 \\ 0.421721u^{16} + 0.107193u^{15} + \cdots + 1.20733u + 0.354020 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1.30324u^{16} + 0.431594u^{15} + \cdots + 0.440056u + 0.241185 \\ 0.753173u^{16} + 0.509168u^{15} + \cdots + 0.734838u + 0.431594 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.550071u^{16} + 0.0775740u^{15} + \cdots + 0.294781u + 0.190409 \\ 0.331453u^{16} + 0.401975u^{15} + \cdots + 0.527504u + 0.0775740 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.390691u^{16} + 0.239774u^{15} + \cdots - 0.0888575u + 0.133992 \\ -0.0888575u^{16} - 0.256700u^{15} + \cdots + 0.424542u - 0.0846262 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.431594u^{16} - 0.753173u^{15} + \cdots - 1.06206u - 0.303244 \\ 0.509168u^{16} - 1.08463u^{15} + \cdots - 0.321580u - 0.753173 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{58}{709}u^{16} + \frac{10}{709}u^{15} + \cdots + \frac{4292}{709}u - \frac{10546}{709}$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.669730 - 0.132211I$ $a = 0.970659 - 0.492921I$ $b = -0.739806 + 0.493958I$	$-0.323057 + 0.236182I$	$-11.08521 + 0.74956I$
$u = -0.669730 + 0.132211I$ $a = 0.970659 + 0.492921I$ $b = -0.739806 - 0.493958I$	$-0.323057 - 0.236182I$	$-11.08521 - 0.74956I$
$u = -0.50994 - 1.47894I$ $a = 1.11526 - 1.09817I$ $b = -1.101610 - 0.741547I$	$7.9938 - 14.6875I$	$-6.10908 + 8.19550I$
$u = -0.50994 + 1.47894I$ $a = 1.11526 + 1.09817I$ $b = -1.101610 + 0.741547I$	$7.9938 + 14.6875I$	$-6.10908 - 8.19550I$
$u = -0.419703$ $a = 0.839208$ $b = -0.359530$	-0.661408	-14.8171
$u = -0.414757 - 1.186601I$ $a = -1.178211 + 0.446005I$ $b = 1.311016 + 0.221936I$	$1.56788 - 6.73537I$	$-9.26043 + 8.18250I$
$u = -0.414757 + 1.186601I$ $a = -1.178211 - 0.446005I$ $b = 1.311016 - 0.221936I$	$1.56788 + 6.73537I$	$-9.26043 - 8.18250I$
$u = 0.046789 - 1.216576I$ $a = 0.682342 + 0.923477I$ $b = -1.18518 + 0.83889I$	$5.79881 + 4.87487I$	$-3.72990 - 6.85875I$
$u = 0.046789 + 1.216576I$ $a = 0.682342 - 0.923477I$ $b = -1.18518 - 0.83889I$	$5.79881 - 4.87487I$	$-3.72990 + 6.85875I$
$u = 0.112796 - 1.249600I$ $a = -0.013860 + 0.318948I$ $b = -0.465319 + 1.172901I$	$7.94985 + 2.22960I$	$2.70903 - 2.09494I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.112796 + 1.249600I$ $a = -0.013860 - 0.318948I$ $b = -0.465319 - 1.172901I$	$7.94985 - 2.22960I$	$2.70903 + 2.09494I$
$u = 0.406786 - 0.457598I$ $a = -1.69104 - 2.30446I$ $b = 0.902416 - 0.208075I$	$-3.24705 + 0.67841I$	$-12.7998 - 8.2767I$
$u = 0.406786 + 0.457598I$ $a = -1.69104 + 2.30446I$ $b = 0.902416 + 0.208075I$	$-3.24705 - 0.67841I$	$-12.7998 + 8.2767I$
$u = 0.43366 - 1.45223I$ $a = -0.214109 - 0.136248I$ $b = -0.602874 - 0.959066I$	$9.54876 + 8.47221I$	$-3.97806 - 4.13044I$
$u = 0.43366 + 1.45223I$ $a = -0.214109 + 0.136248I$ $b = -0.602874 + 0.959066I$	$9.54876 - 8.47221I$	$-3.97806 + 4.13044I$
$u = 0.804249 - 0.105993I$ $a = 1.90935 + 0.10793I$ $b = -0.938877 - 0.582285I$	$-0.99442 - 4.22945I$	$-12.33800 + 5.21456I$
$u = 0.804249 + 0.105993I$ $a = 1.90935 - 0.10793I$ $b = -0.938877 + 0.582285I$	$-0.99442 + 4.22945I$	$-12.33800 - 5.21456I$

III. $\boldsymbol{I_3^u} =$
$\boldsymbol{\langle u^{32}+u^{31}+\cdots-10u+1,\ -3.25\times10^{31}u^{31}-2.96\times10^{31}u^{30}+\cdots+1.19\times10^{33}b-1.77\times10^{33},\ -4.58\times10^{32}u^{31}-2.43\times10^{32}u^{30}+\cdots+1.19\times10^{33}a-1.07\times10^{33}\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.386358u^{31} + 0.204606u^{30} + \cdots + 25.7097u + 0.902540 \\ 0.0273972u^{31} + 0.0249362u^{30} + \cdots - 4.79898u + 1.49534 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.174134u^{31} + 0.222440u^{30} + \cdots + 4.29255u + 5.46458 \\ -0.0239233u^{31} + 0.0484389u^{30} + \cdots - 11.6589u + 1.66803 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.260938u^{31} + 0.412168u^{30} + \cdots + 2.77356u + 5.65649 \\ 0.0630903u^{31} + 0.208509u^{30} + \cdots - 11.0823u + 1.57905 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.354330u^{31} + 0.0841328u^{30} + \cdots + 64.2170u - 3.32913 \\ 0.136723u^{31} + 0.166428u^{30} + \cdots + 10.6850u + 0.0115910 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.413755u^{31} + 0.229543u^{30} + \cdots + 20.9107u + 2.39788 \\ 0.0273972u^{31} + 0.0249362u^{30} + \cdots - 4.79898u + 1.49534 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.0496057u^{31} - 0.641823u^{30} + \cdots + 71.0852u - 7.63877 \\ 0.0219897u^{31} - 0.0446905u^{30} + \cdots + 13.7861u + 0.0332682 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.0606921u^{31} + 0.266131u^{30} + \cdots - 28.3664u - 3.78325$

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.311483-0.244523I$ $a=-1.336896+0.280660I$ $b=\ \ 1.031807+0.655470I$	$2.55512-8.47342I$	$-7.42845+8.75827I$
$u=-1.311483+0.244523I$ $a=-1.336896-0.280660I$ $b=\ \ 1.031807-0.655470I$	$2.55512+8.47342I$	$-7.42845-8.75827I$
$u=-0.902225-0.183392I$ $a=\ \ 1.58265-0.65171I$ $b=-1.09818$	$-1.56793+2.02988I$	$-11.86404-3.46410I$
$u=-0.902225+0.183392I$ $a=\ \ 1.58265+0.65171I$ $b=-1.09818$	$-1.56793-2.02988I$	$-11.86404+3.46410I$
$u=-0.58766-1.68226I$ $a=\ \ 0.269471+0.245526I$ $b=-0.855237+0.665892I$	$7.09422+0.54861I$	$-2.27708-0.10386I$
$u=-0.58766+1.68226I$ $a=\ \ 0.269471-0.245526I$ $b=-0.855237-0.665892I$	$7.09422-0.54861I$	$-2.27708+0.10386I$
$u=-0.428992-1.176698I$ $a=-1.049389+0.915303I$ $b=\ \ 1.031807+0.655470I$	$2.55512-4.41365I$	$-7.42845+1.83007I$
$u=-0.428992+1.176698I$ $a=-1.049389-0.915303I$ $b=\ \ 1.031807-0.655470I$	$2.55512+4.41365I$	$-7.42845-1.83007I$
$u=-0.276533-1.268745I$ $a=\ \ 0.436307+0.105385I$ $b=\ \ 0.570868-0.730671I$	$3.89415-3.16112I$	$-5.41522+3.97489I$
$u=-0.276533+1.268745I$ $a=\ \ 0.436307-0.105385I$ $b=\ \ 0.570868+0.730671I$	$3.89415+3.16112I$	$-5.41522-3.97489I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.22681 - 1.39632I$ $a = -0.176476 + 0.581693I$ $b = \ \ 0.603304$	$4.08977 - 2.02988I$	$-9.89446 + 3.46410I$
$u = -0.22681 + 1.39632I$ $a = -0.176476 - 0.581693I$ $b = \ \ 0.603304$	$4.08977 + 2.02988I$	$-9.89446 - 3.46410I$
$u = -0.038224 - 1.307331I$ $a = -0.846917 - 0.817940I$ $b = -0.855237 - 0.665892I$	$7.09422 - 4.60838I$	$-2.27708 + 7.03206I$
$u = -0.038224 + 1.307331I$ $a = -0.846917 + 0.817940I$ $b = -0.855237 + 0.665892I$	$7.09422 + 4.60838I$	$-2.27708 - 7.03206I$
$u = -0.005656 - 1.214893I$ $a = \ \ 0.55909 - 2.18287I$ $b = -0.855237 - 0.665892I$	$7.09422 - 0.54861I$	$-2.27708 + 0.10386I$
$u = -0.005656 + 1.214893I$ $a = \ \ 0.55909 + 2.18287I$ $b = -0.855237 + 0.665892I$	$7.09422 + 0.54861I$	$-2.27708 - 0.10386I$
$u = \ \ 0.037930 - 0.138502I$ $a = \ \ 3.80839 - 1.94785I$ $b = \ \ 1.031807 + 0.655470I$	$2.55512 - 4.41365I$	$-7.42845 + 1.83007I$
$u = \ \ 0.037930 + 0.138502I$ $a = \ \ 3.80839 + 1.94785I$ $b = \ \ 1.031807 - 0.655470I$	$2.55512 + 4.41365I$	$-7.42845 - 1.83007I$
$u = \ \ 0.160424 - 1.272505I$ $a = -0.084039 + 0.265408I$ $b = \ \ 0.570868 + 0.730671I$	$3.89415 - 0.89865I$	$-5.41522 + 2.95331I$
$u = \ \ 0.160424 + 1.272505I$ $a = -0.084039 - 0.265408I$ $b = \ \ 0.570868 - 0.730671I$	$3.89415 + 0.89865I$	$-5.41522 - 2.95331I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.197023 - 0.116195I$ $a = 2.90919 + 1.78434I$ $b = 0.570868 - 0.730671I$	$3.89415 + 0.89865I$	$-5.41522 - 2.95331I$
$u = 0.197023 + 0.116195I$ $a = 2.90919 - 1.78434I$ $b = 0.570868 + 0.730671I$	$3.89415 - 0.89865I$	$-5.41522 + 2.95331I$
$u = 0.216724 - 1.003930I$ $a = 1.58111 + 0.52369I$ $b = -1.09818$	$-1.56793 + 2.02988I$	$-11.86404 - 3.46410I$
$u = 0.216724 + 1.003930I$ $a = 1.58111 - 0.52369I$ $b = -1.09818$	$-1.56793 - 2.02988I$	$-11.86404 + 3.46410I$
$u = 0.368018 - 1.240793I$ $a = -1.46652 - 1.43024I$ $b = 1.031807 - 0.655470I$	$2.55512 + 8.47342I$	$-7.42845 - 8.75827I$
$u = 0.368018 + 1.240793I$ $a = -1.46652 + 1.43024I$ $b = 1.031807 + 0.655470I$	$2.55512 - 8.47342I$	$-7.42845 + 8.75827I$
$u = 0.458630 - 0.994798I$ $a = -1.57460 + 0.97008I$ $b = 0.603304$	$4.08977 + 2.02988I$	$-9.89446 - 3.46410I$
$u = 0.458630 + 0.994798I$ $a = -1.57460 - 0.97008I$ $b = 0.603304$	$4.08977 - 2.02988I$	$-9.89446 + 3.46410I$
$u = 0.73963 - 1.58748I$ $a = 1.029658 + 0.891727I$ $b = -0.855237 + 0.665892I$	$7.09422 + 4.60838I$	$-2.27708 - 7.03206I$
$u = 0.73963 + 1.58748I$ $a = 1.029658 - 0.891727I$ $b = -0.855237 - 0.665892I$	$7.09422 - 4.60838I$	$-2.27708 + 7.03206I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.099204 - 0.381032I$ $a = -0.641037 + 0.056217I$ $b = 0.570868 + 0.730671I$	$3.89415 + 3.16112I$	$-5.41522 - 3.97489I$
$u = 1.099204 + 0.381032I$ $a = -0.641037 - 0.056217I$ $b = 0.570868 - 0.730671I$	$3.89415 - 3.16112I$	$-5.41522 + 3.97489I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_4	$(u^7+4u^5+\cdots+4u+1)(u^{17}+7u^{15}+\cdots+u+1)$ $(u^{32}+u^{31}+\cdots-10u+1)$
c_2	$(u^7-u^6-u^5+u^4+2u^3-u^2-u+1)$ $(-1+2u-2u^3+u^4+2u^5-u^6-u^7+u^8)^4(u^{17}+6u^{16}+\cdots+26u+4)$
c_3	$(u^2-u+1)^{16}(u^7+u^6+u^5+u^4-u^2-u-1)$ $(u^{17}+18u^{16}+\cdots+2816u+256)$
c_5, c_7	$(u^7-u^6+\cdots-u+1)(u^{17}-u^{16}+\cdots+6u-1)$ $(u^{32}+9u^{31}+\cdots+602u+73)$
c_6, c_{10}	$(u^7+4u^5+\cdots+4u-1)(u^{17}+7u^{15}+\cdots+u+1)$ $(u^{32}+u^{31}+\cdots-10u+1)$
c_8	$(u^7+u^6-u^5-u^4+2u^3+u^2-u-1)$ $(-1+2u-2u^3+u^4+2u^5-u^6-u^7+u^8)^4(u^{17}+6u^{16}+\cdots+26u+4)$
c_9	$(u^7+3u^6+7u^5+9u^4+10u^3+7u^2+3u+1)$ $(u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1)^4$ $(u^{17}+6u^{16}+\cdots+188u+16)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4, c_6	$(y^7 + 8y^6 + 28y^5 + 55y^4 + 64y^3 + 42y^2 + 12y - 1)$
c_{10}	$(y^{17} + 14y^{16} + \cdots + 7y - 1)(y^{32} + 27y^{31} + \cdots + 72y + 1)$
c_2, c_8	$(y^7 - 3y^6 + 7y^5 - 9y^4 + 10y^3 - 7y^2 + 3y - 1)$ $(y^8 - 3y^7 + 7y^6 - 10y^5 + 11y^4 - 10y^3 + 6y^2 - 4y + 1)^4$ $(y^{17} - 6y^{16} + \cdots + 188y - 16)$
c_3	$(y^2 + y + 1)^{16}(y^7 + y^6 - y^5 - y^4 + 2y^3 + y^2 - y - 1)$ $(y^{17} + 2y^{16} + \cdots + 524288y - 65536)$
c_5, c_7	$(y^7 + y^6 + \cdots - y - 1)(y^{17} + 3y^{16} + \cdots + 6y - 1)$ $(y^{32} + 11y^{31} + \cdots + 23912y + 5329)$
c_9	$(y^7 + 5y^6 + 15y^5 + 23y^4 + 10y^3 - 7y^2 - 5y - 1)$ $(y^8 + 5y^7 + 11y^6 + 6y^5 - 17y^4 - 34y^3 - 22y^2 - 4y + 1)^4$ $(y^{17} + 10y^{16} + \cdots + 14704y - 256)$