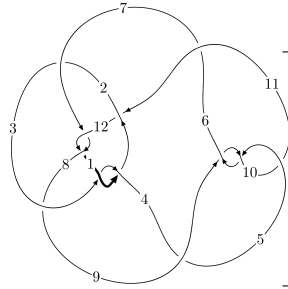
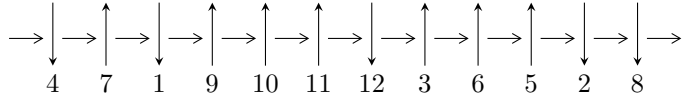


12a₁₁₂₁ (K12a₁₁₂₁)



A knot diagram¹

Linearized knot diagram



Solving Sequence

$$6,9 \xrightarrow{c_9} 10 \xrightarrow{c_5} 5 \xrightarrow{c_{10}} 11 \xrightarrow{c_6} 7 \xrightarrow{c_4} 1,4 \xrightarrow{c_1} 2 \xrightarrow{c_3} 3 \xrightarrow{c_8} 8 \xrightarrow{c_{12}} 12 \Rightarrow c_2, c_7, c_{11}$$

Ideals for irreducible components² of X_{par}

$$I_1^u = (5.90630 \times 10^{49} u^{89} + 1.31991 \times 10^{50} u^{88} + \dots + 4.25606 \times 10^{49} b + 3.51669 \times 10^{49}, \\ - 1.65197 \times 10^{49} u^{89} - 4.23977 \times 10^{48} u^{88} + \dots + 4.25606 \times 10^{49} a - 8.68845 \times 10^{48}, u^{90} + 3u^{89} + \dots + u +$$

* 1 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 90 representations.

¹The image of knot diagram is generated by the software “**Draw programme**” developed by Andrew Bartholomew(<http://www.layer8.co.uk/maths/draw/index.htm#Running-draw>), where we modified some parts for our purpose(<https://github.com/CATsTAILs/LinksPainter>).

²All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I.

$$I_1^u = \langle 5.91 \times 10^{49} u^{89} + 1.32 \times 10^{50} u^{88} + \dots + 4.26 \times 10^{49} b + 3.52 \times 10^{49}, -1.65 \times 10^{49} u^{89} - 4.24 \times 10^{48} u^{88} + \dots + 4.26 \times 10^{49} a - 8.69 \times 10^{48}, u^{90} + 3u^{89} + \dots + u + 1 \rangle$$

(i) Arc colorings

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

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

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

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

$$a_7 = \begin{pmatrix} u^5 + 2u^3 + u \\ -u^7 - 3u^5 - 2u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.388146u^{89} + 0.0996172u^{88} + \dots - 3.53913u + 0.204143 \\ -1.38774u^{89} - 3.10125u^{88} + \dots - 1.81453u - 0.826277 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.373224u^{89} + 0.168382u^{88} + \dots - 6.26564u - 0.00828401 \\ -1.30287u^{89} - 2.95085u^{88} + \dots - 0.411641u - 0.715405 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.384238u^{89} + 0.247633u^{88} + \dots - 6.17011u - 0.0491235 \\ -1.23224u^{89} - 2.80698u^{88} + \dots - 0.113134u - 0.765808 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.326104u^{89} - 1.12314u^{88} + \dots - 2.90218u + 0.138637 \\ 0.0488887u^{89} - 0.0899770u^{88} + \dots - 5.97900u + 1.15368 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.905595u^{89} + 3.12820u^{88} + \dots - 6.17823u - 0.729495 \\ -1.10592u^{89} - 2.60082u^{88} + \dots - 3.75255u + 1.73185 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $2.39862u^{89} + 7.11016u^{88} + \dots - 12.9059u + 1.64968$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3	$u^{90} - u^{89} + \dots - 31u + 1$
c_2	$u^{90} + 3u^{89} + \dots + u + 1$
c_4, c_6	$u^{90} + 3u^{89} + \dots + 7251u + 1721$
c_5, c_9, c_{10}	$u^{90} - 3u^{89} + \dots - u + 1$
c_7, c_{12}	$u^{90} - u^{89} + \dots + 3u + 1$
c_8	$u^{90} - u^{89} + \dots + 65361u + 5017$
c_{11}	$u^{90} + 35u^{89} + \dots + 75u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3	$y^{90} - 59y^{89} + \dots - 335y + 1$
c_2	$y^{90} - 3y^{89} + \dots - 95y + 1$
c_4, c_6	$y^{90} - 67y^{89} + \dots + 48208201y + 2961841$
c_5, c_9, c_{10}	$y^{90} + 73y^{89} + \dots + 9y + 1$
c_7, c_{12}	$y^{90} - 67y^{89} + \dots + 9y + 1$
c_8	$y^{90} - 255y^{89} + \dots + 4511974197y + 25170289$
c_{11}	$y^{90} - 331y^{89} + \dots - 9007y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.937123$ $a = 1.90392$ $b = -0.917372$	1.63736	19.5510
$u = -0.261061 + 1.099980I$ $a = -0.436661 - 1.288730I$ $b = 0.922105 + 0.512288I$	$-1.31351 - 2.59617I$	0
$u = -0.261061 - 1.099980I$ $a = -0.436661 + 1.288730I$ $b = 0.922105 - 0.512288I$	$-1.31351 + 2.59617I$	0
$u = -0.849717 + 0.127541I$ $a = 2.58445 - 2.17478I$ $b = -1.05607 + 1.83759I$	$-0.89862 - 13.13250I$	$2.00000 + 7.64404I$
$u = -0.849717 - 0.127541I$ $a = 2.58445 + 2.17478I$ $b = -1.05607 - 1.83759I$	$-0.89862 + 13.13250I$	$2.00000 - 7.64404I$
$u = 0.841272 + 0.138052I$ $a = -2.63082 - 1.87687I$ $b = 1.16893 + 1.60792I$	$3.99372 + 7.68634I$	$5.01991 - 6.90086I$
$u = 0.841272 - 0.138052I$ $a = -2.63082 + 1.87687I$ $b = 1.16893 - 1.60792I$	$3.99372 - 7.68634I$	$5.01991 + 6.90086I$
$u = -0.819056 + 0.226853I$ $a = 2.33150 - 1.49762I$ $b = -1.03530 + 1.27468I$	$1.07734 - 1.28710I$	$11.1015 + 10.6083I$
$u = -0.819056 - 0.226853I$ $a = 2.33150 + 1.49762I$ $b = -1.03530 - 1.27468I$	$1.07734 + 1.28710I$	$11.1015 - 10.6083I$
$u = 0.827904 + 0.067788I$ $a = -0.308488 - 0.082776I$ $b = 0.014970 - 0.313093I$	$6.67284 + 2.65477I$	$9.38233 - 1.76568I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.827904 - 0.067788I$ $a = -0.308488 + 0.082776I$ $b = 0.014970 + 0.313093I$	$6.67284 - 2.65477I$	$9.38233 + 1.76568I$
$u = 0.403334 + 1.103620I$ $a = 0.18830 - 1.67878I$ $b = -0.99729 + 1.41348I$	$1.03582 - 3.19789I$	0
$u = 0.403334 - 1.103620I$ $a = 0.18830 + 1.67878I$ $b = -0.99729 - 1.41348I$	$1.03582 + 3.19789I$	0
$u = -0.814581 + 0.083546I$ $a = -0.330391 - 0.060506I$ $b = 0.333110 - 0.548293I$	$3.22864 - 6.64156I$	$4.09104 + 6.26285I$
$u = -0.814581 - 0.083546I$ $a = -0.330391 + 0.060506I$ $b = 0.333110 + 0.548293I$	$3.22864 + 6.64156I$	$4.09104 - 6.26285I$
$u = -0.466390 + 0.665000I$ $a = 0.68025 - 1.38405I$ $b = -0.07940 + 1.41778I$	$-0.55470 - 2.94063I$	$5.53893 + 10.70355I$
$u = -0.466390 - 0.665000I$ $a = 0.68025 + 1.38405I$ $b = -0.07940 - 1.41778I$	$-0.55470 + 2.94063I$	$5.53893 - 10.70355I$
$u = -0.803094$ $a = 1.70297$ $b = -1.03993$	2.35076	4.70780
$u = -0.415202 + 1.125870I$ $a = -0.07193 - 1.70685I$ $b = 0.94307 + 1.68550I$	$-3.95530 + 8.58651I$	0
$u = -0.415202 - 1.125870I$ $a = -0.07193 + 1.70685I$ $b = 0.94307 - 1.68550I$	$-3.95530 - 8.58651I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.780177$ $a = 28.8634$ $b = -17.3034$	0.642195	236.630
$u = -0.768657 + 0.045497I$ $a = -1.26138 + 2.23210I$ $b = 0.30449 - 1.66593I$	$2.11470 - 2.09203I$	$6.08144 + 3.20366I$
$u = -0.768657 - 0.045497I$ $a = -1.26138 - 2.23210I$ $b = 0.30449 + 1.66593I$	$2.11470 + 2.09203I$	$6.08144 - 3.20366I$
$u = -0.359082 + 1.182080I$ $a = -0.277386 - 0.260116I$ $b = -0.497689 - 0.461522I$	$-0.13150 + 2.39964I$	0
$u = -0.359082 - 1.182080I$ $a = -0.277386 + 0.260116I$ $b = -0.497689 + 0.461522I$	$-0.13150 - 2.39964I$	0
$u = 0.750884 + 0.074464I$ $a = 1.56606 + 1.08475I$ $b = -0.333629 - 1.250990I$	$-2.07688 + 4.03513I$	$-0.77206 - 5.75428I$
$u = 0.750884 - 0.074464I$ $a = 1.56606 - 1.08475I$ $b = -0.333629 + 1.250990I$	$-2.07688 - 4.03513I$	$-0.77206 + 5.75428I$
$u = 0.750322$ $a = 4.62706$ $b = -2.19293$	0.926282	10.3150
$u = 0.516388 + 0.539580I$ $a = -1.22279 - 1.21451I$ $b = 0.33652 + 1.68820I$	$-6.08532 + 8.60177I$	$-2.05233 - 8.35929I$
$u = 0.516388 - 0.539580I$ $a = -1.22279 + 1.21451I$ $b = 0.33652 - 1.68820I$	$-6.08532 - 8.60177I$	$-2.05233 + 8.35929I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.587527 + 0.460758I$ $a = -1.49865 - 1.57895I$ $b = 0.04068 + 1.52677I$	$-5.79931 - 4.64010I$	$-2.15185 + 2.96139I$
$u = 0.587527 - 0.460758I$ $a = -1.49865 + 1.57895I$ $b = 0.04068 - 1.52677I$	$-5.79931 + 4.64010I$	$-2.15185 - 2.96139I$
$u = 0.276456 + 1.222790I$ $a = -0.308998 + 0.239699I$ $b = 0.356193 - 1.081640I$	$-5.54460 - 0.31885I$	0
$u = 0.276456 - 1.222790I$ $a = -0.308998 - 0.239699I$ $b = 0.356193 + 1.081640I$	$-5.54460 + 0.31885I$	0
$u = 0.377586 + 1.200650I$ $a = 0.412056 - 0.409749I$ $b = 0.140629 - 0.207567I$	$3.19378 + 1.68551I$	0
$u = 0.377586 - 1.200650I$ $a = 0.412056 + 0.409749I$ $b = 0.140629 + 0.207567I$	$3.19378 - 1.68551I$	0
$u = -0.313949 + 1.237250I$ $a = -0.350967 + 0.874435I$ $b = -0.48753 - 1.41857I$	$-1.54414 - 1.81425I$	0
$u = -0.313949 - 1.237250I$ $a = -0.350967 - 0.874435I$ $b = -0.48753 + 1.41857I$	$-1.54414 + 1.81425I$	0
$u = 0.058868 + 1.282810I$ $a = -0.515422 - 0.374024I$ $b = -1.12297 - 1.06200I$	$-6.48452 - 0.22424I$	0
$u = 0.058868 - 1.282810I$ $a = -0.515422 + 0.374024I$ $b = -1.12297 + 1.06200I$	$-6.48452 + 0.22424I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.091814 + 1.294430I$ $a = -0.471118 + 0.058377I$ $b = 0.478551 - 0.284575I$	$-3.57869 - 2.12683I$	0
$u = -0.091814 - 1.294430I$ $a = -0.471118 - 0.058377I$ $b = 0.478551 + 0.284575I$	$-3.57869 + 2.12683I$	0
$u = 0.334734 + 1.267370I$ $a = 1.19920 + 10.92680I$ $b = 8.39728 - 6.86782I$	$-3.28894 + 4.01947I$	0
$u = 0.334734 - 1.267370I$ $a = 1.19920 - 10.92680I$ $b = 8.39728 + 6.86782I$	$-3.28894 - 4.01947I$	0
$u = 0.021231 + 1.312000I$ $a = -0.37337 + 1.68595I$ $b = -0.90144 + 1.52731I$	$-6.45174 + 1.00513I$	0
$u = 0.021231 - 1.312000I$ $a = -0.37337 - 1.68595I$ $b = -0.90144 - 1.52731I$	$-6.45174 - 1.00513I$	0
$u = -0.687457$ $a = -2.11270$ $b = 0.254874$	-3.59454	-2.08330
$u = 0.317138 + 1.278160I$ $a = -2.36082 + 1.97757I$ $b = 2.24217 + 0.55331I$	$-3.05253 + 3.84993I$	0
$u = 0.317138 - 1.278160I$ $a = -2.36082 - 1.97757I$ $b = 2.24217 - 0.55331I$	$-3.05253 - 3.84993I$	0
$u = -0.464583 + 1.233390I$ $a = -0.763414 - 0.959331I$ $b = 0.691780 + 0.454765I$	$-2.15640 - 4.97754I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.464583 - 1.233390I$ $a = -0.763414 + 0.959331I$ $b = 0.691780 - 0.454765I$	$-2.15640 + 4.97754I$	0
$u = -0.291881 + 1.294590I$ $a = 1.81902 + 0.69556I$ $b = -0.444399 + 0.401299I$	$-7.67966 - 3.54806I$	0
$u = -0.291881 - 1.294590I$ $a = 1.81902 - 0.69556I$ $b = -0.444399 - 0.401299I$	$-7.67966 + 3.54806I$	0
$u = -0.354603 + 1.280270I$ $a = -0.578559 - 0.882544I$ $b = 1.106940 + 0.030534I$	$-1.63707 - 4.16714I$	0
$u = -0.354603 - 1.280270I$ $a = -0.578559 + 0.882544I$ $b = 1.106940 - 0.030534I$	$-1.63707 + 4.16714I$	0
$u = 0.085495 + 1.336500I$ $a = 0.895958 + 0.606142I$ $b = -0.0647435 - 0.0674574I$	$-6.92803 + 5.33049I$	0
$u = 0.085495 - 1.336500I$ $a = 0.895958 - 0.606142I$ $b = -0.0647435 + 0.0674574I$	$-6.92803 - 5.33049I$	0
$u = -0.333079 + 1.300200I$ $a = 2.15159 - 0.17648I$ $b = -0.17385 + 1.88326I$	$-2.09133 - 6.07186I$	0
$u = -0.333079 - 1.300200I$ $a = 2.15159 + 0.17648I$ $b = -0.17385 - 1.88326I$	$-2.09133 + 6.07186I$	0
$u = -0.024488 + 1.344540I$ $a = -0.25708 + 1.78304I$ $b = 0.086305 + 1.139830I$	$-10.82350 - 2.16535I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.024488 - 1.344540I$		
$a = -0.25708 - 1.78304I$	$-10.82350 + 2.16535I$	0
$b = 0.086305 - 1.139830I$		
$u = 0.325021 + 1.315680I$		
$a = -1.83650 + 0.60450I$	$-6.43488 + 7.93390I$	0
$b = 0.301394 + 1.359290I$		
$u = 0.325021 - 1.315680I$		
$a = -1.83650 - 0.60450I$	$-6.43488 - 7.93390I$	0
$b = 0.301394 - 1.359290I$		
$u = 0.366790 + 1.314970I$		
$a = 0.103265 + 0.202107I$	$2.34671 + 6.95130I$	0
$b = -0.153689 + 0.371111I$		
$u = 0.366790 - 1.314970I$		
$a = 0.103265 - 0.202107I$	$2.34671 - 6.95130I$	0
$b = -0.153689 - 0.371111I$		
$u = -0.357962 + 1.323750I$		
$a = 0.252483 + 0.656103I$	$-1.18201 - 10.86480I$	0
$b = -0.199867 + 0.595001I$		
$u = -0.357962 - 1.323750I$		
$a = 0.252483 - 0.656103I$	$-1.18201 + 10.86480I$	0
$b = -0.199867 - 0.595001I$		
$u = -0.372698 + 1.353660I$		
$a = -2.57177 - 0.28581I$	$-5.5579 - 17.5286I$	0
$b = 1.10000 - 1.96529I$		
$u = -0.372698 - 1.353660I$		
$a = -2.57177 + 0.28581I$	$-5.5579 + 17.5286I$	0
$b = 1.10000 + 1.96529I$		
$u = 0.367205 + 1.358040I$		
$a = 2.38128 - 0.41798I$	$-0.71612 + 12.03670I$	0
$b = -1.24184 - 1.76183I$		

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.367205 - 1.358040I$ $a = 2.38128 + 0.41798I$ $b = -1.24184 + 1.76183I$	$-0.71612 - 12.03670I$	0
$u = 0.11948 + 1.41428I$ $a = 0.799214 - 0.923726I$ $b = -0.40851 - 2.07647I$	$-12.3236 + 10.6039I$	0
$u = 0.11948 - 1.41428I$ $a = 0.799214 + 0.923726I$ $b = -0.40851 + 2.07647I$	$-12.3236 - 10.6039I$	0
$u = 0.15556 + 1.42068I$ $a = 1.273220 - 0.518064I$ $b = -0.40014 - 1.78278I$	$-11.86630 - 2.13825I$	0
$u = 0.15556 - 1.42068I$ $a = 1.273220 + 0.518064I$ $b = -0.40014 + 1.78278I$	$-11.86630 + 2.13825I$	0
$u = -0.36575 + 1.39002I$ $a = -2.00001 - 0.37638I$ $b = 1.29946 - 1.37796I$	$-4.01462 - 5.61115I$	0
$u = -0.36575 - 1.39002I$ $a = -2.00001 + 0.37638I$ $b = 1.29946 + 1.37796I$	$-4.01462 + 5.61115I$	0
$u = -0.10871 + 1.43775I$ $a = -0.711700 - 0.571145I$ $b = 0.41423 - 2.05484I$	$-7.26188 - 4.73080I$	0
$u = -0.10871 - 1.43775I$ $a = -0.711700 + 0.571145I$ $b = 0.41423 + 2.05484I$	$-7.26188 + 4.73080I$	0
$u = 0.363666 + 0.367971I$ $a = -0.71092 - 1.39826I$ $b = -0.358401 + 0.121100I$	$-1.70262 + 3.89923I$	$0.47407 - 8.44781I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.363666 - 0.367971I$ $a = -0.71092 + 1.39826I$ $b = -0.358401 - 0.121100I$	$-1.70262 - 3.89923I$	$0.47407 + 8.44781I$
$u = -0.443041 + 0.210244I$ $a = 1.115080 - 0.803627I$ $b = -0.243882 + 0.331160I$	$0.977445 - 0.443469I$	$9.13598 + 2.65028I$
$u = -0.443041 - 0.210244I$ $a = 1.115080 + 0.803627I$ $b = -0.243882 - 0.331160I$	$0.977445 + 0.443469I$	$9.13598 - 2.65028I$
$u = -0.128903 + 0.435158I$ $a = 0.05734 - 1.56254I$ $b = 0.210102 - 1.022530I$	$-5.45762 - 1.72264I$	$-7.56446 + 4.36840I$
$u = -0.128903 - 0.435158I$ $a = 0.05734 + 1.56254I$ $b = 0.210102 + 1.022530I$	$-5.45762 + 1.72264I$	$-7.56446 - 4.36840I$
$u = 0.296041 + 0.340592I$ $a = -0.266482 - 0.465775I$ $b = 0.669387 + 0.440484I$	$-1.76112 - 1.36605I$	$0.34312 - 1.73006I$
$u = 0.296041 - 0.340592I$ $a = -0.266482 + 0.465775I$ $b = 0.669387 - 0.440484I$	$-1.76112 + 1.36605I$	$0.34312 + 1.73006I$
$u = -0.352145$ $a = -0.773626$ $b = -1.24362$	-4.02007	9.15390
$u = 0.137293 + 0.265055I$ $a = 0.19984 - 1.40052I$ $b = 0.363542 - 0.923994I$	$-1.69230 + 0.56377I$	$-4.96157 + 0.85721I$
$u = 0.137293 - 0.265055I$ $a = 0.19984 + 1.40052I$ $b = 0.363542 + 0.923994I$	$-1.69230 - 0.56377I$	$-4.96157 - 0.85721I$

II. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3	$u^{90} - u^{89} + \dots - 31u + 1$
c_2	$u^{90} + 3u^{89} + \dots + u + 1$
c_4, c_6	$u^{90} + 3u^{89} + \dots + 7251u + 1721$
c_5, c_9, c_{10}	$u^{90} - 3u^{89} + \dots - u + 1$
c_7, c_{12}	$u^{90} - u^{89} + \dots + 3u + 1$
c_8	$u^{90} - u^{89} + \dots + 65361u + 5017$
c_{11}	$u^{90} + 35u^{89} + \dots + 75u + 1$

III. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3	$y^{90} - 59y^{89} + \dots - 335y + 1$
c_2	$y^{90} - 3y^{89} + \dots - 95y + 1$
c_4, c_6	$y^{90} - 67y^{89} + \dots + 48208201y + 2961841$
c_5, c_9, c_{10}	$y^{90} + 73y^{89} + \dots + 9y + 1$
c_7, c_{12}	$y^{90} - 67y^{89} + \dots + 9y + 1$
c_8	$y^{90} - 255y^{89} + \dots + 4511974197y + 25170289$
c_{11}	$y^{90} - 331y^{89} + \dots - 9007y + 1$