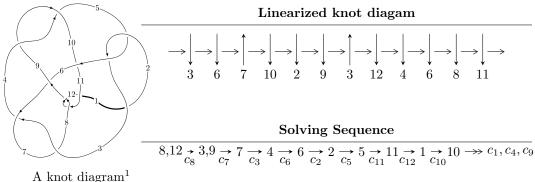
$12n_{0368} (K12n_{0368})$



A knot diagram¹

Ideals for irreducible components² of X_{par}

$$\begin{split} I_1^u &= \langle 4.99290 \times 10^{29} u^{27} - 9.04354 \times 10^{29} u^{26} + \dots + 1.48123 \times 10^{30} b + 2.22464 \times 10^{30}, \\ &1.79527 \times 10^{31} u^{27} - 3.40599 \times 10^{31} u^{26} + \dots + 4.44370 \times 10^{30} a + 1.93917 \times 10^{32}, \ u^{28} - 2u^{27} + \dots + 15u - 12u^2 \\ I_2^u &= \langle -u^{15} - u^{14} + \dots + b - 1, \ -6u^{15} + 2u^{14} + \dots + a - 10, \\ u^{16} - 5u^{14} + u^{13} + 13u^{12} - 3u^{11} - 23u^{10} + 6u^9 + 29u^8 - 8u^7 - 26u^6 + 8u^5 + 16u^4 - 4u^3 - 6u^2 + u + 1 \rangle \\ I_3^u &= \langle b - 1, \ a - 1, \ u + 1 \rangle \end{split}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 45 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).

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

$$\begin{matrix} \text{I. } I_1^u = \\ \langle 4.99 \times 10^{29} u^{27} - 9.04 \times 10^{29} u^{26} + \dots + 1.48 \times 10^{30} b + 2.22 \times 10^{30}, \ 1.80 \times 10^{31} u^{27} - \\ 3.41 \times 10^{31} u^{26} + \dots + 4.44 \times 10^{30} a + 1.94 \times 10^{32}, \ u^{28} - 2u^{27} + \dots + 15u - 1 \rangle \end{matrix}$$

(i) Arc colorings

$$a_{8} = \begin{pmatrix} 1\\0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0\\u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0\\u \end{pmatrix}$$

$$a_{3} = \begin{pmatrix} -4.04003u^{27} + 7.66476u^{26} + \dots + 200.372u - 43.6386 \\ -0.337077u^{27} + 0.610541u^{26} + \dots + 8.04513u - 1.50188 \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} 1\\u^{2} \end{pmatrix}$$

$$a_{7} = \begin{pmatrix} 4.84634u^{27} - 9.14511u^{26} + \dots - 218.138u + 47.6168 \\ 0.162770u^{27} - 0.345209u^{26} + \dots - 15.7091u + 2.22482 \end{pmatrix}$$

$$a_{4} = \begin{pmatrix} -9.48708u^{27} + 18.0943u^{26} + \dots + 467.082u - 96.8502 \\ -0.312623u^{27} + 0.470169u^{26} + \dots + 9.63585u - 2.96138 \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} 4.97301u^{27} - 9.41740u^{26} + \dots - 230.480u + 49.2941 \\ 0.173164u^{27} - 0.347370u^{26} + \dots - 15.2980u + 2.20586 \end{pmatrix}$$

$$a_{2} = \begin{pmatrix} -12.5790u^{27} + 23.8637u^{26} + \dots + 606.925u - 129.004 \\ -0.600077u^{27} + 1.10181u^{26} + \dots + 27.4907u - 4.83602 \end{pmatrix}$$

$$a_{5} = \begin{pmatrix} -16.7676u^{27} + 31.8085u^{26} + \dots + 818.466u - 172.294 \\ -0.699475u^{27} + 1.15355u^{26} + \dots + 25.6721u - 5.70735 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u\\u \end{pmatrix}$$

$$a_{1} = \begin{pmatrix} -u^{3}\\-u^{3}+u \end{pmatrix}$$

$$a_{1} = \begin{pmatrix} -u^{3}\\-u^{3}+u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 15.6689u^{27} - 29.9384u^{26} + \dots - 773.348u + 161.864 \\ 0.340769u^{27} - 0.720300u^{26} + \dots - 15.5800u + 4.83370 \end{pmatrix}$$

- (ii) Obstruction class = -1
- (iii) Cusp Shapes = $2.36235u^{27} 4.45969u^{26} + \cdots 84.8018u + 5.95686$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{28} + 56u^{27} + \dots + 733262u + 28561$
c_2, c_5	$u^{28} + 2u^{27} + \dots - 1450u - 169$
c_3, c_7	$u^{28} - 4u^{27} + \dots + 156u + 23$
c_4,c_9	$u^{28} - 24u^{26} + \dots + 46u - 43$
<i>c</i> ₆	$u^{28} - 3u^{27} + \dots - u - 1$
c_8, c_{11}	$u^{28} + 2u^{27} + \dots - 15u - 1$
c_{10}	$u^{28} - 63u^{26} + \dots + 129664u + 33653$
c_{12}	$u^{28} + 26u^{27} + \dots + 87u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{28} - 188y^{27} + \dots - 348035375138y + 815730721$
c_2, c_5	$y^{28} - 56y^{27} + \dots - 733262y + 28561$
c_3, c_7	$y^{28} + 32y^{27} + \dots + 1516y + 529$
c_4,c_9	$y^{28} - 48y^{27} + \dots - 11662y + 1849$
<i>c</i> ₆	$y^{28} - 3y^{27} + \dots - 13y + 1$
c_8, c_{11}	$y^{28} - 26y^{27} + \dots - 87y + 1$
c_{10}	$y^{28} - 126y^{27} + \dots - 33547178288y + 1132524409$
c_{12}	$y^{28} - 38y^{27} + \dots - 11231y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.906896 + 0.646886I		
a = -0.018709 - 0.380835I	1.71311 + 2.54690I	-1.43844 - 1.11774I
b = -0.638662 + 0.021294I		
u = -0.906896 - 0.646886I		
a = -0.018709 + 0.380835I	1.71311 - 2.54690I	-1.43844 + 1.11774I
b = -0.638662 - 0.021294I		
u = 0.967377 + 0.607852I		
a = 0.156659 - 0.808047I	-1.84113 - 4.28473I	-9.39382 + 5.33049I
b = 0.094276 - 0.264187I		
u = 0.967377 - 0.607852I		
a = 0.156659 + 0.808047I	-1.84113 + 4.28473I	-9.39382 - 5.33049I
b = 0.094276 + 0.264187I		
u = -1.213110 + 0.327569I		
a = 0.57852 - 1.90768I	-4.18195 + 4.33996I	-13.7175 - 7.6147I
b = -0.26231 - 1.86751I		
u = -1.213110 - 0.327569I		
a = 0.57852 + 1.90768I	-4.18195 - 4.33996I	-13.7175 + 7.6147I
b = -0.26231 + 1.86751I		
u = 0.614251 + 0.338068I		
a = -0.531012 + 0.325089I	-0.982240 + 0.119994I	-8.17175 + 0.02561I
b = 0.489062 - 0.020644I		
u = 0.614251 - 0.338068I		
a = -0.531012 - 0.325089I	-0.982240 - 0.119994I	-8.17175 - 0.02561I
b = 0.489062 + 0.020644I		
u = 0.696063		
a = -0.481673	-0.946260	-10.4550
b = 0.373251		
u = 1.257950 + 0.387635I		
a = -0.74898 - 1.66086I	-4.49564 - 1.87179I	-14.6317 - 1.5633I
b = 0.123685 - 1.210180I		

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.257950 - 0.387635I		
a = -0.74898 + 1.66086I	-4.49564 + 1.87179I	-14.6317 + 1.5633I
b = 0.123685 + 1.210180I		
u = -0.07059 + 1.45889I		
a = -0.0475163 - 0.0400773I	-18.0323 + 4.3258I	-11.73246 - 2.08575I
b = -0.21400 - 1.78782I		
u = -0.07059 - 1.45889I		
a = -0.0475163 + 0.0400773I	-18.0323 - 4.3258I	-11.73246 + 2.08575I
b = -0.21400 + 1.78782I		
u = 1.50606		
a = -1.25220	-15.4303	-22.9460
b = -3.31724		
u = -0.036535 + 0.484008I		
a = -0.642458 + 0.305211I	-0.78712 - 1.33307I	-6.90000 + 4.82501I
b = -0.141755 + 0.946555I		
u = -0.036535 - 0.484008I		
a = -0.642458 - 0.305211I	-0.78712 + 1.33307I	-6.90000 - 4.82501I
b = -0.141755 - 0.946555I		
u = 1.57314 + 0.15250I		
a = 0.34179 + 1.42667I	-10.36200 + 1.52321I	-13.77194 - 1.67469I
b = -0.20624 + 2.13211I		
u = 1.57314 - 0.15250I		
a = 0.34179 - 1.42667I	-10.36200 - 1.52321I	-13.77194 + 1.67469I
b = -0.20624 - 2.13211I		
u = -1.61185		
a = -0.871275	-16.6517	-17.2310
b = 0.575915		
u = -1.61164 + 0.12556I		
a = -0.01556 + 1.51530I	-11.04510 + 5.13574I	-13.9862 - 3.3545I
b = 0.42383 + 1.60874I		

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -1.61164 - 0.12556I		
a = -0.01556 - 1.51530I	-11.04510 - 5.13574I	-13.9862 + 3.3545I
b = 0.42383 - 1.60874I		
u = 0.055371 + 0.305690I		
a = -1.91148 + 0.93139I	-4.59867 - 3.49978I	-13.2785 + 5.9062I
b = 0.441705 - 1.203630I		
u = 0.055371 - 0.305690I		
a = -1.91148 - 0.93139I	-4.59867 + 3.49978I	-13.2785 - 5.9062I
b = 0.441705 + 1.203630I		
u = 1.56528 + 0.69723I		
a = 0.61493 + 1.30760I	16.4052 - 11.9046I	-13.05540 + 4.81403I
b = -0.73222 + 1.97314I		
u = 1.56528 - 0.69723I		
a = 0.61493 - 1.30760I	16.4052 + 11.9046I	-13.05540 - 4.81403I
b = -0.73222 - 1.97314I		
u = -1.53853 + 0.79216I		
a = -0.793628 + 0.857092I	17.0288 + 3.5616I	-13.06254 + 0.I
b = 0.34136 + 1.61067I		
u = -1.53853 - 0.79216I		
a = -0.793628 - 0.857092I	17.0288 - 3.5616I	-13.06254 + 0.I
b = 0.34136 - 1.61067I		
u = 0.0975704		
a = -30.3600	-10.1503	0.912190
b = -1.06939		

$$II. \\ I_2^u = \langle -u^{15} - u^{14} + \dots + b - 1, \ -6u^{15} + 2u^{14} + \dots + a - 10, \ u^{16} - 5u^{14} + \dots + u + 1 \rangle$$

(i) Arc colorings

$$a_{8} = \begin{pmatrix} 1\\0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0\\u \end{pmatrix}$$

$$a_{3} = \begin{pmatrix} 6u^{15} - 2u^{14} + \dots - 15u + 10\\u^{15} + u^{14} + \dots - 4u + 1 \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} 1\\u^{2} \end{pmatrix}$$

$$a_{7} = \begin{pmatrix} 5u^{15} - 4u^{14} + \dots - 10u + 13\\3u^{15} - 2u^{14} + \dots - 2u + 3 \end{pmatrix}$$

$$a_{4} = \begin{pmatrix} 13u^{15} - 5u^{14} + \dots - 30u + 25\\u^{14} - u^{13} + \dots - 5u + 1 \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} 6u^{15} - 4u^{14} + \dots - 11u + 12\\3u^{15} - 2u^{14} + \dots - 3u + 3 \end{pmatrix}$$

$$a_{2} = \begin{pmatrix} 16u^{15} - 7u^{14} + \dots - 35u + 29\\3u^{15} - u^{14} + \dots - 4u + 5 \end{pmatrix}$$

$$a_{5} = \begin{pmatrix} -18u^{15} + 9u^{14} + \dots + 38u - 40\\-u^{15} + 5u^{13} + \dots + 5u - 4 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u\\u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u\\u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^{3}\\-u^{3} + u \end{pmatrix}$$

$$a_{13} = \begin{pmatrix} -u^{3}\\-u^{3} + u \end{pmatrix}$$

$$a_{14} = \begin{pmatrix} -u^{3}\\-u^{3} + u \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes =
$$-13u^{15} + 4u^{14} + 60u^{13} - 31u^{12} - 141u^{11} + 76u^{10} + 230u^9 - 132u^8 - 260u^7 + 157u^6 + 200u^5 - 136u^4 - 96u^3 + 62u^2 + 25u - 31$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{16} - 16u^{15} + \dots - 8u + 1$
c_2	$u^{16} + 4u^{15} + \dots + 4u + 1$
c_3	$u^{16} + 4u^{14} + \dots - 6u + 1$
c_4	$u^{16} - 10u^{14} + \dots - 2u - 1$
<i>C</i> ₅	$u^{16} - 4u^{15} + \dots - 4u + 1$
	$u^{16} - 3u^{15} + \dots - 3u - 1$
c_7	$u^{16} + 4u^{14} + \dots + 6u + 1$
<i>C</i> ₈	$u^{16} - 5u^{14} + \dots + u + 1$
<i>c</i> ₉	$u^{16} - 10u^{14} + \dots + 2u - 1$
c_{10}	$u^{16} + 2u^{15} + \dots + 7u^2 - 1$
c_{11}	$u^{16} - 5u^{14} + \dots - u + 1$
c_{12}	$u^{16} + 10u^{15} + \dots + 13u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{16} - 52y^{15} + \dots + 20y + 1$
c_2, c_5	$y^{16} - 16y^{15} + \dots - 8y + 1$
c_3, c_7	$y^{16} + 8y^{15} + \dots - 10y + 1$
c_4, c_9	$y^{16} - 20y^{15} + \dots + 4y + 1$
	$y^{16} + y^{15} + \dots - 15y + 1$
c_8, c_{11}	$y^{16} - 10y^{15} + \dots - 13y + 1$
c_{10}	$y^{16} - 38y^{15} + \dots - 14y + 1$
c_{12}	$y^{16} + 2y^{15} + \dots - 17y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.772761 + 0.712653I		
a = 0.214642 + 0.139490I	-3.18731 - 4.89171I	-13.3342 + 7.1832I
b = -0.174212 + 0.983327I		
u = 0.772761 - 0.712653I		
a = 0.214642 - 0.139490I	-3.18731 + 4.89171I	-13.3342 - 7.1832I
b = -0.174212 - 0.983327I		
u = -1.026470 + 0.385848I		
a = 0.97974 - 2.34875I	-6.20371 + 5.58512I	-14.9139 - 6.6172I
b = -0.64749 - 1.56601I		
u = -1.026470 - 0.385848I		
a = 0.97974 + 2.34875I	-6.20371 - 5.58512I	-14.9139 + 6.6172I
b = -0.64749 + 1.56601I		
u = -0.868992 + 0.775777I		
a = 0.422206 - 0.337071I	1.11054 + 2.92387I	-11.66623 - 5.71389I
b = -0.267354 + 0.100433I		
u = -0.868992 - 0.775777I		
a = 0.422206 + 0.337071I	1.11054 - 2.92387I	-11.66623 + 5.71389I
b = -0.267354 - 0.100433I		
u = 1.153510 + 0.323030I		
a = -0.52474 - 1.80473I	-4.07711 - 3.14561I	-13.9405 + 2.6304I
b = -0.125626 - 1.307330I		
u = 1.153510 - 0.323030I		
a = -0.52474 + 1.80473I	-4.07711 + 3.14561I	-13.9405 - 2.6304I
b = -0.125626 + 1.307330I		
u = -0.730829 + 0.328251I		
a = -0.476380 - 0.106565I	-5.07627 - 2.52540I	-16.3893 + 0.5079I
b = -0.722249 + 1.146800I		
u = -0.730829 - 0.328251I		
a = -0.476380 + 0.106565I	-5.07627 + 2.52540I	-16.3893 - 0.5079I
b = -0.722249 - 1.146800I		

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.004110 + 0.721375I		
a = -1.101500 - 0.625779I	-3.89724 - 0.61018I	-12.26838 + 0.63265I
b = 0.144368 - 1.128410I		
u = 1.004110 - 0.721375I		
a = -1.101500 + 0.625779I	-3.89724 + 0.61018I	-12.26838 - 0.63265I
b = 0.144368 + 1.128410I		
u = 0.698430 + 0.203647I		
a = -1.272980 + 0.463255I	-2.24714 + 0.87508I	-15.0335 - 1.9463I
b = 0.148546 + 0.648408I		
u = 0.698430 - 0.203647I		
a = -1.272980 - 0.463255I	-2.24714 - 0.87508I	-15.0335 + 1.9463I
b = 0.148546 - 0.648408I		
u = -0.491820		
a = 7.05656	-10.4382	-27.2890
b = 1.05815		
u = -1.51322		
a = 0.461470	-14.7824	-9.61910
b = 2.22988		

III.
$$I_3^u = \langle b-1, a-1, u+1 \rangle$$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

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

$$a_7 = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

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

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

- (ii) Obstruction class = -1
- (iii) Cusp Shapes = -18

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing		
$c_1, c_2, c_3 \\ c_5, c_6, c_7 \\ c_{12}$	u+1		
c_4, c_8, c_9 c_{10}, c_{11}	u-1		

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing		
c_1, c_2, c_3 c_4, c_5, c_6 c_7, c_8, c_9 c_{10}, c_{11}, c_{12}	y-1		

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -1.00000		
a = 1.00000	-4.93480	-18.0000
b = 1.00000		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u+1)(u^{16} - 16u^{15} + \dots - 8u + 1)$ $\cdot (u^{28} + 56u^{27} + \dots + 733262u + 28561)$
c_2	$(u+1)(u^{16}+4u^{15}+\cdots+4u+1)(u^{28}+2u^{27}+\cdots-1450u-169)$
c_3	$(u+1)(u^{16}+4u^{14}+\cdots-6u+1)(u^{28}-4u^{27}+\cdots+156u+23)$
C4	$(u-1)(u^{16}-10u^{14}+\cdots-2u-1)(u^{28}-24u^{26}+\cdots+46u-43)$
c_5	$(u+1)(u^{16}-4u^{15}+\cdots-4u+1)(u^{28}+2u^{27}+\cdots-1450u-169)$
c_6	$(u+1)(u^{16}-3u^{15}+\cdots-3u-1)(u^{28}-3u^{27}+\cdots-u-1)$
c_7	$(u+1)(u^{16}+4u^{14}+\cdots+6u+1)(u^{28}-4u^{27}+\cdots+156u+23)$
c_8	$(u-1)(u^{16}-5u^{14}+\cdots+u+1)(u^{28}+2u^{27}+\cdots-15u-1)$
c_9	$(u-1)(u^{16}-10u^{14}+\cdots+2u-1)(u^{28}-24u^{26}+\cdots+46u-43)$
c_{10}	$(u-1)(u^{16} + 2u^{15} + \dots + 7u^2 - 1)$ $\cdot (u^{28} - 63u^{26} + \dots + 129664u + 33653)$
c_{11}	$(u-1)(u^{16}-5u^{14}+\cdots-u+1)(u^{28}+2u^{27}+\cdots-15u-1)$
c_{12}	$(u+1)(u^{16}+10u^{15}+\cdots+13u+1)(u^{28}+26u^{27}+\cdots+87u+1)$ 19

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)(y^{16} - 52y^{15} + \dots + 20y + 1)$ $\cdot (y^{28} - 188y^{27} + \dots - 348035375138y + 815730721)$
c_2, c_5	$(y-1)(y^{16} - 16y^{15} + \dots - 8y + 1)$ $\cdot (y^{28} - 56y^{27} + \dots - 733262y + 28561)$
c_3, c_7	$(y-1)(y^{16} + 8y^{15} + \dots - 10y + 1)(y^{28} + 32y^{27} + \dots + 1516y + 529)$
c_4, c_9	$(y-1)(y^{16}-20y^{15}+\cdots+4y+1)(y^{28}-48y^{27}+\cdots-11662y+1849)$
c_6	$(y-1)(y^{16}+y^{15}+\cdots-15y+1)(y^{28}-3y^{27}+\cdots-13y+1)$
c_8, c_{11}	$(y-1)(y^{16}-10y^{15}+\cdots-13y+1)(y^{28}-26y^{27}+\cdots-87y+1)$
c_{10}	$(y-1)(y^{16} - 38y^{15} + \dots - 14y + 1)$ $\cdot (y^{28} - 126y^{27} + \dots - 33547178288y + 1132524409)$
c_{12}	$(y-1)(y^{16}+2y^{15}+\cdots-17y+1)(y^{28}-38y^{27}+\cdots-11231y+1)$