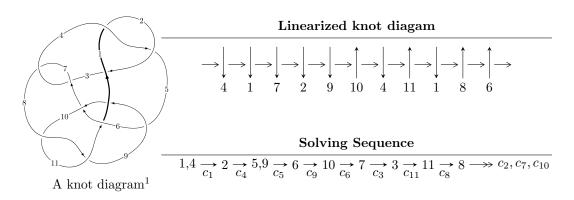
# $11n_{36} (K11n_{36})$



#### Ideals for irreducible components<sup>2</sup> of $X_{par}$

$$\begin{split} I_1^u &= \langle 2.74497 \times 10^{33} u^{40} + 1.38636 \times 10^{34} u^{39} + \dots + 3.54634 \times 10^{33} b - 7.84109 \times 10^{31}, \\ &2.58793 \times 10^{33} u^{40} + 1.11480 \times 10^{34} u^{39} + \dots + 3.54634 \times 10^{33} a - 9.38667 \times 10^{33}, \ u^{41} + 7u^{40} + \dots + 2u + 17u^{40} + \dots + 2u^{40} + \dots +$$

\* 3 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 49 representations.

<sup>&</sup>lt;sup>1</sup>The 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).

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

 $I. \\ I_1^u = \langle 2.74 \times 10^{33} u^{40} + 1.39 \times 10^{34} u^{39} + \dots + 3.55 \times 10^{33} b - 7.84 \times 10^{31}, \ 2.59 \times 10^{33} u^{40} + 1.11 \times 10^{34} u^{39} + \dots + 3.55 \times 10^{33} a - 9.39 \times 10^{33}, \ u^{41} + 7u^{40} + \dots + 2u + 1 \rangle$ 

(i) Arc colorings

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

$$a_{4} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_{5} = \begin{pmatrix} -u \\ -u^{3} + u \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} -0.729746u^{40} - 3.14351u^{39} + \dots - 16.1294u + 2.64686 \\ -0.774027u^{40} - 3.90927u^{39} + \dots - 5.77644u + 0.0221103 \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} -1.47326u^{40} - 6.97084u^{39} + \dots + 1.83626u - 0.252120 \\ 0.773071u^{40} + 4.41057u^{39} + \dots + 1.49955u + 1.25550 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0442820u^{40} + 0.765761u^{39} + \dots - 10.3529u + 2.62475 \\ -0.774027u^{40} - 3.90927u^{39} + \dots - 5.77644u + 0.0221103 \end{pmatrix}$$

$$a_{7} = \begin{pmatrix} 1.89468u^{40} + 10.8589u^{39} + \dots - 3.67648u + 4.04534 \\ -4.09416u^{40} - 22.1611u^{39} + \dots - 6.24482u - 2.19947 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} 1.60981u^{40} + 8.17572u^{39} + \dots + 9.41348u + 0.620656 \\ 0.427689u^{40} + 2.12225u^{39} + \dots + 3.33185u - 0.204351 \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} 1.89468u^{40} + 10.8589u^{39} + \dots - 3.67648u + 4.04534 \\ -0.427689u^{40} - 2.12225u^{39} + \dots - 3.33185u + 0.204351 \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} 1.89468u^{40} + 10.8589u^{39} + \dots - 3.67648u + 4.04534 \\ -0.427689u^{40} - 2.12225u^{39} + \dots - 3.33185u + 0.204351 \end{pmatrix}$$

- (ii) Obstruction class = -1
- (iii) Cusp Shapes =  $9.46225u^{40} + 53.2125u^{39} + \cdots + 10.2497u + 12.8539$

#### (iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_4$	$u^{41} - 7u^{40} + \dots + 2u - 1$
$c_2$	$u^{41} + 43u^{40} + \dots + 12u + 1$
$c_3, c_7$	$u^{41} + 2u^{40} + \dots + 96u + 32$
<i>C</i> <sub>5</sub>	$u^{41} + 4u^{40} + \dots - 237u + 191$
<i>c</i> <sub>6</sub>	$u^{41} + 16u^{39} + \dots - 1085u - 79$
$c_8, c_{10}$	$u^{41} + 5u^{40} + \dots + 119u + 1$
<i>c</i> <sub>9</sub>	$u^{41} - 6u^{40} + \dots + 156u - 8$
$c_{11}$	$u^{41} + 3u^{40} + \dots - 2u - 1$

#### (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_4$	$y^{41} - 43y^{40} + \dots + 12y - 1$
$c_2$	$y^{41} - 83y^{40} + \dots + 1144y - 1$
$c_3, c_7$	$y^{41} - 30y^{40} + \dots + 3584y - 1024$
	$y^{41} + 8y^{40} + \dots + 999709y - 36481$
	$y^{41} + 32y^{40} + \dots + 183721y - 6241$
$c_{8}, c_{10}$	$y^{41} - 21y^{40} + \dots + 13495y - 1$
<i>c</i> <sub>9</sub>	$y^{41} - 18y^{40} + \dots + 7824y - 64$
$c_{11}$	$y^{41} - 11y^{40} + \dots + 26y - 1$

## (vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.387590 + 0.911908I		
a = -0.252509 - 0.478840I	-2.61027 - 2.03740I	-5.72892 + 3.65159I
b = 1.071600 + 0.110579I		
u = 0.387590 - 0.911908I		
a = -0.252509 + 0.478840I	-2.61027 + 2.03740I	-5.72892 - 3.65159I
b = 1.071600 - 0.110579I		
u = 0.695393 + 0.752192I		
a = 0.171525 - 0.630794I	-3.58550 - 3.36599I	-6.85826 + 4.39505I
b = 1.287490 + 0.541839I		
u = 0.695393 - 0.752192I		
a = 0.171525 + 0.630794I	-3.58550 + 3.36599I	-6.85826 - 4.39505I
b = 1.287490 - 0.541839I		
u = 0.883212		
a = -8.08484	0.458131	-57.1150
b = -0.317773		
u = 1.149310 + 0.071261I		
a = -1.59369 + 0.46729I	-0.578838 - 1.255810I	2.38019 + 0.I
b = -0.160687 + 0.786703I		
u = 1.149310 - 0.071261I		
a = -1.59369 - 0.46729I	-0.578838 + 1.255810I	2.38019 + 0.I
b = -0.160687 - 0.786703I		
u = 0.508644 + 1.042800I		
a = -0.333727 + 0.529481I	-1.17487 - 9.23550I	0. + 7.03311I
b = -1.26087 - 0.71395I		
u = 0.508644 - 1.042800I		
a = -0.333727 - 0.529481I	-1.17487 + 9.23550I	0 7.03311I
b = -1.26087 + 0.71395I		
u = -0.817513 + 0.853964I		
a = -0.249736 - 0.135119I	4.46595 + 3.11596I	-9.1421 - 11.7493I
b = -0.502875 + 0.177164I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.817513 - 0.853964I		
a = -0.249736 + 0.135119I	4.46595 - 3.11596I	-9.1421 + 11.7493I
b = -0.502875 - 0.177164I		
u = -0.762796 + 0.059538I		
a = -0.517105 + 0.839463I	4.65237 + 4.48889I	10.07507 - 5.98728I
b = -0.465748 + 1.069230I		
u = -0.762796 - 0.059538I		
a = -0.517105 - 0.839463I	4.65237 - 4.48889I	10.07507 + 5.98728I
b = -0.465748 - 1.069230I		
u = 0.858145 + 0.924978I		
a = -0.119106 + 0.545272I	-2.16828 + 2.66511I	0
b = -1.093570 + 0.304255I		
u = 0.858145 - 0.924978I		
a = -0.119106 - 0.545272I	-2.16828 - 2.66511I	0
b = -1.093570 - 0.304255I		
u = 0.737003		
a = -0.781314	-1.10369	-8.82470
b = -0.0927869		
u = 0.612280 + 0.220916I		
a = -2.04946 + 4.65031I	0.484163 - 0.158339I	13.38590 + 1.00156I
b = -0.010448 - 0.399153I		
u = 0.612280 - 0.220916I		
a = -2.04946 - 4.65031I	0.484163 + 0.158339I	13.38590 - 1.00156I
b = -0.010448 + 0.399153I		
u = 0.380775 + 0.454242I		
a = -0.51545 - 1.79136I	1.43126 - 2.56358I	1.01752 + 7.87421I
b = -0.444963 + 1.151080I		
u = 0.380775 - 0.454242I		
a = -0.51545 + 1.79136I	1.43126 + 2.56358I	1.01752 - 7.87421I
b = -0.444963 - 1.151080I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.46523 + 0.11671I		
a = 1.34696 - 0.69695I	-5.33009 + 0.54259I	0
b = 1.262320 - 0.189235I		
u = 1.46523 - 0.11671I		
a = 1.34696 + 0.69695I	-5.33009 - 0.54259I	0
b = 1.262320 + 0.189235I		
u = -1.48400		
a = -2.11095	-2.98279	0
b = -2.27004		
u = -1.51445 + 0.11394I		
a = -0.301276 - 1.124650I	-4.95010 + 4.48342I	0
b = -0.58113 - 2.13843I		
u = -1.51445 - 0.11394I		
a = -0.301276 + 1.124650I	-4.95010 - 4.48342I	0
b = -0.58113 + 2.13843I		
u = -1.56483 + 0.05519I		
a =  0.765814 - 0.615203I	-6.84034 + 1.09870I	0
b = 0.519201 + 0.768233I		
u = -1.56483 - 0.05519I		
a = 0.765814 + 0.615203I	-6.84034 - 1.09870I	0
b = 0.519201 - 0.768233I		
u = -1.53570 + 0.38602I		
a = 1.094720 + 0.335992I	-8.77885 + 6.88775I	0
b = 1.195690 - 0.685677I		
u = -1.53570 - 0.38602I		
a = 1.094720 - 0.335992I	-8.77885 - 6.88775I	0
b = 1.195690 + 0.685677I		
u = 1.60618 + 0.13682I		
a = -1.43496 - 0.20448I	-3.96071 - 6.10430I	0
b = -1.248460 - 0.492822I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.60618 - 0.13682I		
a = -1.43496 + 0.20448I	-3.96071 + 6.10430I	0
b = -1.248460 + 0.492822I		
u = -1.61056 + 0.23381I		
a = 1.69093 - 0.02813I	-11.27280 + 7.05517I	0
b = 1.81725 - 1.03078I		
u = -1.61056 - 0.23381I		
a = 1.69093 + 0.02813I	-11.27280 - 7.05517I	0
b = 1.81725 + 1.03078I		
u = -1.58766 + 0.38818I		
a = -1.60185 - 0.23694I	-7.9395 + 14.4828I	0
b = -1.47850 + 1.01659I		
u = -1.58766 - 0.38818I		
a = -1.60185 + 0.23694I	-7.9395 - 14.4828I	0
b = -1.47850 - 1.01659I		
u = -1.68426 + 0.19522I		
a = -1.133500 - 0.234872I	-11.04370 + 1.47634I	0
b = -1.139920 + 0.414386I		
u = -1.68426 - 0.19522I		
a = -1.133500 + 0.234872I	-11.04370 - 1.47634I	0
b = -1.139920 - 0.414386I		
u = -0.213366 + 0.037411I		
a = 0.62944 + 2.88854I	0.05575 - 1.50352I	0.38191 + 4.17550I
b = 0.480792 + 0.712878I		
u = -0.213366 - 0.037411I		_
a = 0.62944 - 2.88854I	0.05575 + 1.50352I	0.38191 - 4.17550I
b = 0.480792 - 0.712878I		
u = 0.059485 + 0.186213I		
a = 0.39154 - 2.74926I	2.56340 + 0.10081I	4.27921 + 2.25595I
b = -0.906876 - 0.270893I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.059485 - 0.186213I		
a = 0.39154 + 2.74926I	2.56340 - 0.10081I	4.27921 - 2.25595I
b = -0.906876 + 0.270893I		

II.  $I_2^u = \langle a^4 - 6a^3 + 9a^2 + b - 8a + 3, \ a^5 - 6a^4 + 9a^3 - 8a^2 + 4a - 1, \ u - 1 \rangle$ 

(i) Arc colorings

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

$$a_{4} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

$$a_{5} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} -a^{4} + 6a^{3} - 9a^{2} + 8a - 3 \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} -2a^{4} + 11a^{3} - 12a^{2} + 7a - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a^{4} - 6a^{3} + 9a^{2} - 7a + 3 \\ -a^{4} + 6a^{3} - 9a^{2} + 8a - 3 \end{pmatrix}$$

$$a_{7} = \begin{pmatrix} 0 \\ -3a^{4} + 16a^{3} - 15a^{2} + 7a - 1 \end{pmatrix}$$

$$a_{3} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a^{4} - 6a^{3} + 9a^{2} - 7a + 3 \\ -3a^{4} + 16a^{3} - 15a^{2} + 7a - 1 \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} -3a^{4} + 16a^{3} - 15a^{2} + 7a - 1 \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} -3a^{4} + 16a^{3} - 15a^{2} + 7a - 1 \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} -3a^{4} + 16a^{3} - 15a^{2} + 7a - 1 \end{pmatrix}$$

- (ii) Obstruction class = 1
- (iii) Cusp Shapes =  $9a^4 48a^3 + 48a^2 32a$

#### (iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$(u-1)^5$
$c_2, c_4$	$(u+1)^5$
$c_3, c_7$	$u^5$
$c_5,c_9$	$u^5 + u^4 + 2u^3 + u^2 + u + 1$
$c_{6}, c_{8}$	$u^5 - u^4 - 2u^3 + u^2 + u + 1$
$c_{10}$	$u^5 + u^4 - 2u^3 - u^2 + u - 1$
$c_{11}$	$u^5 - 3u^4 + 4u^3 - u^2 - u + 1$

## (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_2, c_4$	$(y-1)^5$
$c_3, c_7$	$y^5$
$c_5, c_9$	$y^5 + 3y^4 + 4y^3 + y^2 - y - 1$
$c_6, c_8, c_{10}$	$y^5 - 5y^4 + 8y^3 - 3y^2 - y - 1$
$c_{11}$	$y^5 - y^4 + 8y^3 - 3y^2 + 3y - 1$

## (vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.00000		
a = 0.313425 + 0.691081I	4.22763 - 4.40083I	-8.55516 + 1.78781I
b = 0.455697 + 1.200150I		
u = 1.00000		
a = 0.313425 - 0.691081I	4.22763 + 4.40083I	-8.55516 - 1.78781I
b = 0.455697 - 1.200150I		
u = 1.00000		
a = 0.542256 + 0.333011I	-1.31583 + 1.53058I	-8.42731 - 4.45807I
b = -0.339110 + 0.822375I		
u = 1.00000		
a = 0.542256 - 0.333011I	-1.31583 - 1.53058I	-8.42731 + 4.45807I
b = -0.339110 - 0.822375I		
u = 1.00000		
a = 4.28864	0.756147	3.96490
b = 0.766826		

III. 
$$I_3^u = \langle b, 3u^2 + a + 5u + 4, u^3 + u^2 - 1 \rangle$$

(i) Arc colorings

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

$$a_{4} = \begin{pmatrix} 0\\u \end{pmatrix}$$

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

$$a_{5} = \begin{pmatrix} -u\\u^{2} + u - 1 \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} -3u^{2} - 5u - 4\\0 \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} -9u^{2} - 17u - 12\\u^{2} + u - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -3u^{2} - 5u - 4\\0 \end{pmatrix}$$

$$a_{7} = \begin{pmatrix} -u\\u^{2} + u - 1 \end{pmatrix}$$

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

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

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

$$a_{8} = \begin{pmatrix} -u\\2u^{2} + u - 2 \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} -u\\2u^{2} + u - 2 \end{pmatrix}$$

- (ii) Obstruction class = 1
- (iii) Cusp Shapes =  $21u^2 + 45u + 39$

#### (iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^3 + u^2 - 1$
$c_2, c_7$	$u^3 + u^2 + 2u + 1$
$c_3$	$u^3 - u^2 + 2u - 1$
$c_4$	$u^3 - u^2 + 1$
$c_5, c_6$	$u^3 - 2u^2 - 3u - 1$
$c_8$	$(u+1)^3$
$c_9$	$u^3$
$c_{10}$	$(u-1)^3$
$c_{11}$	$u^3 + 3u^2 + 2u - 1$

## (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_4$	$y^3 - y^2 + 2y - 1$
$c_2, c_3, c_7$	$y^3 + 3y^2 + 2y - 1$
$c_5, c_6$	$y^3 - 10y^2 + 5y - 1$
$c_8,c_{10}$	$(y-1)^3$
<i>c</i> <sub>9</sub>	$y^3$
$c_{11}$	$y^3 - 5y^2 + 10y - 1$

## (vi) Complex Volumes and Cusp Shapes

Solutions to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.877439 + 0.744862I		
a = -0.258045 + 0.197115I	4.66906 + 2.82812I	4.03193 + 6.06881I
b = 0		
u = -0.877439 - 0.744862I		
a = -0.258045 - 0.197115I	4.66906 - 2.82812I	4.03193 - 6.06881I
b = 0		
u = 0.754878		
a = -9.48391	0.531480	84.9360
b = 0		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$((u-1)^5)(u^3+u^2-1)(u^{41}-7u^{40}+\cdots+2u-1)$
$c_2$	$((u+1)^5)(u^3+u^2+2u+1)(u^{41}+43u^{40}+\cdots+12u+1)$
$c_3$	$u^{5}(u^{3} - u^{2} + 2u - 1)(u^{41} + 2u^{40} + \dots + 96u + 32)$
$c_4$	$((u+1)^5)(u^3-u^2+1)(u^{41}-7u^{40}+\cdots+2u-1)$
<i>C</i> 5	$(u^3 - 2u^2 - 3u - 1)(u^5 + u^4 + 2u^3 + u^2 + u + 1)$ $\cdot (u^{41} + 4u^{40} + \dots - 237u + 191)$
$c_6$	$(u^3 - 2u^2 - 3u - 1)(u^5 - u^4 - 2u^3 + u^2 + u + 1)$ $\cdot (u^{41} + 16u^{39} + \dots - 1085u - 79)$
$c_7$	$u^{5}(u^{3} + u^{2} + 2u + 1)(u^{41} + 2u^{40} + \dots + 96u + 32)$
c <sub>8</sub>	$((u+1)^3)(u^5 - u^4 + \dots + u + 1)(u^{41} + 5u^{40} + \dots + 119u + 1)$
<i>C</i> 9	$u^{3}(u^{5} + u^{4} + \dots + u + 1)(u^{41} - 6u^{40} + \dots + 156u - 8)$
$c_{10}$	$((u-1)^3)(u^5+u^4+\cdots+u-1)(u^{41}+5u^{40}+\cdots+119u+1)$
$c_{11}$	$(u^{3} + 3u^{2} + 2u - 1)(u^{5} - 3u^{4} + 4u^{3} - u^{2} - u + 1)$ $\cdot (u^{41} + 3u^{40} + \dots - 2u - 1)$

#### V. Riley Polynomials

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