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Results for the Groups SL(2,3^4) and SL(2,3^6)

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Abstract
The character table of rational representations and the induced characters table study to gain the Artin indicator for the groups*SL(2,3^4)* and *SL(2,3^6)* in this work.

Keywords: Rationalcharacter table, induced characters table, Artin indicator.

1. Introduction

The group of all matrices of determinant 1 is $\mathcal{SL}$(n,F), [1] and [2], searchers in [3] define the representation of the group.

In this work we compute the Artin indicator for the groups $\mathcal{SL}(2,3^4)$ and $\mathcal{SL}(2,3^6)$.

2. The Concepts

The relationships that we extracted above represent a complex analysis of all the components of technologies

Theorem2.1:[1] $|\ \mathcal{SL}(2,q^n)\ | = q^n\ (q^{2n}-1)$.

Definition 2.4: [4]Let H be a cyclic subgroup of a group G, and ϕ be a class function of H. Then

$$\phi\uparrow^{G}(g)=\frac{|C_G(g)|}{|C_H(g)|}\sum_{i=1}^{m}\phi(x_i)$$

The character induced from the principal character of cyclic subgroups of G is Artin character.

Definition 2.5: [5]The character induced from the principal character of a cyclic subgroups of G is called Artin character.

Definition 2.6: [5]Let G be a finite group and let χ be any rational valued character on G. The smallest positive number n such that,

$$n\chi = \sum_c a_c \phi_c$$

where $a_c \in Z$ and ϕ_c is Artin character, is called the Artin exponent of G and denoted by A(G).

3. The Results

Authors in [4] and [7-8] study the character table of rational representations for the group $\mathcal{SL}(2,p)$ we apply that idea and compute the character table of rational representations for the groups $\mathcal{SL}(2,3^4)$ and $\mathcal{SL}(2,3^6)$. Also we apply the same idea in [4] and [6] to compute the Artinindicator for the same groups.

3.1. The results for the group $\mathcal{SL}(2,3^4)$

The character table of rational representations for the group $\mathcal{SL}(2,3^4)$ is

C_g	1	z	c=d	zc=zd	a^1	a^2	a^4	a^5	a^8	a^{10}	a^{16}	a^{20}	b^1	b^2
$\|C_g\|$	1	1	3280	3280	6642	6642	6642	6642	6642	6642	6642	6642	6480	6480
$\|C_G(g)\|$	531360	531360	162	162	80	80	80	80	80	80	80	80	82	82
1_G	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ψ	81	81	0	0	1	1	1	1	1	1	1	1	-1	-1
χ_1	2624	-2624	32	-32	0	0	0	0	256	0	-256	0	0	0
χ_2	656	656	8	8	0	0	64	0	-64	0	-128	-256	0	0
χ_4	328	328	4	4	0	8	-8	0	-16	-32	0	32	0	0
χ_5	656	-656	8	-8	0	0	0	-32	-64	-64	64	64	0	0
χ_8	164	164	2	2	-2	-4	-8	8	8	4	8	8	0	0
χ_{10}	164	164	2	2	0	0	-8	-8	8	8	8	8	0	0
χ_{16}	164	164	2	2	-2	-4	8	8	8	8	8	8	0	0
χ_{20}	82	82	1	1	0	-2	2	2	2	2	2	2	0	0
θ_1	3200	-3200	-40	40	0	0	0	0	0	0	0	0	-40	40
θ_2	1600	1600	-20	-20	0	0	0	0	0	0	0	0	20	0
ξ	82	82	1	1	-2	2	2	-2	2	2	2	2	0	0
η	160	-160	-1	1	0	0	0	0	0	0	0	0	4	-4

The Artin character table for the group $\mathcal{SL}(2,3^4)$ is

C_g	1	z	c=d	zc=zd	a^1	a^2	a^4	a^5	a^8	a^{10}	a^{16}	a^{20}	b^1	b^2
$\|C_g\|$	1	1	3280	3280	6642	6642	6642	6642	6642	6642	6642	6642	6480	6480
$\|C_G(g)\|$	531360	531360	162	162	80	80	80	80	80	80	80	80	82	82
Φ_1	531360	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ_2	132840	132840	0	0	0	0	0	0	0	0	0	0	0	0
Φ_3	6560	0	2	0	0	0	0	0	0	0	0	0	0	0
Φ_4	6560	9840	2	2	0	0	0	0	0	0	0	0	0	0
Φ_5	6642	13284	0	0	2	0	0	0	0	0	0	0	0	0
Φ_6	13284	26568	0	0	0	4	0	0	0	0	0	0	0	0
Φ_7	26568	0	0	0	0	0	8	0	0	0	0	0	0	0
Φ_8	88560	177120	0	0	0	0	0	10	0	0	0	0	0	0
Φ_9	53136	0	0	0	0	0	0	0	16	0	0	0	0	0
Φ_{10}	66420	0	0	0	0	0	0	0	0	20	0	0	0	0
Φ_{11}	106272	0	0	0	0	0	0	0	0	0	32	0	0	0
Φ_{12}	132840	0	0	0	0	0	0	0	0	0	0	40	0	0
Φ_{13}	6480	12960	0	0	0	0	0	0	0	0	0	0	2	0
Φ_{14}	12960	0	0	0	0	0	0	0	0	0	0	0	0	2

Hence, we written the rational valued characters in the first tables as a linear combination of induced characters in the second table

$1=\frac{1}{2}\Phi_{14}+\frac{1}{2}\Phi_{13}+\frac{1}{40}\Phi_{12}+\frac{1}{32}\Phi_{11}+\frac{1}{20}\Phi_{10}+\frac{1}{16}\Phi_9+\frac{1}{10}\Phi_8+\frac{1}{8}\Phi_7+\frac{1}{4}\Phi_6+\frac{1}{2}\Phi_5+\frac{1}{2}\Phi_4-\frac{42395}{132840}\Phi_2-\frac{2707}{531360}\Phi_1$

$\Psi=-\frac{1}{2}\Phi_{14}-\frac{1}{2}\Phi_{13}+\frac{1}{40}\Phi_{12}+\frac{1}{32}\Phi_{11}+\frac{1}{20}\Phi_{10}+\frac{1}{16}\Phi_9+\frac{1}{10}\Phi_8+\frac{1}{8}\Phi_7+\frac{1}{4}\Phi_6+\frac{1}{2}\Phi_5-\frac{24435}{132840}\Phi_2+\frac{2133}{531360}\Phi_1$

$\chi_1=-8\Phi_{11}+16\Phi_9-16\Phi_4+32\Phi_3+\frac{154816}{132840}\Phi_2-\frac{257152}{531360}\Phi_1$

$\chi_2=-6.4\Phi_{12}-4\Phi_{11}-4\Phi_9+8\Phi_7+4\Phi_4-\frac{38704}{132840}\Phi_2+\frac{1288384}{531360}\Phi_1$

$\chi_4=0.8\Phi_{12}-1.6\Phi_{10}-\Phi_9-\Phi_7+2\Phi_6-\frac{72488}{132840}\Phi_2-\frac{112832}{531360}\Phi_1$

$\chi_5=1.6\Phi_{12}+2\Phi_{11}-3.2\Phi_{10}-4\Phi_9-3.2\Phi_8-4\Phi_4+8\Phi_3+\frac{605488}{132840}\Phi_2-\frac{347680}{531360}\Phi_1$

$\chi_8=0.2\Phi_{12}+0.25\,\Phi_{11}+0.2\,\Phi_{10}+0.5\,\Phi_9+0.8\,\Phi_8-\Phi_7-\Phi_6-\Phi_5+\Phi_4-\frac{111520}{132840}\Phi_2-\frac{112218}{531360}\Phi_1$

$\chi_{10}=0.2\Phi_{12}+0.25\,\Phi_{11}+0.4\,\Phi_{10}+0.05\,\Phi_9-0.8\,\Phi_8-\Phi_7+\Phi_4+\frac{132020}{132840}\Phi_2-\frac{133402}{531360}\Phi_1$

$\chi_{16}=0.2\Phi_{12}+0.25\,\Phi_{11}+0.4\,\Phi_{10}+0.05\,\Phi_9+0.8\,\Phi_8+\Phi_7-\Phi_6-\Phi_5+\Phi_4-\frac{111520}{132840}\Phi_2-\frac{78638}{531360}\Phi_1$

$\chi_{20}=0.05\Phi_{12}+0.0625\Phi_{11}+0.1\Phi_{10}+0.125\,\Phi_9+0.2\Phi_8+0.25\Phi_7-0.5\Phi_6+0.5\Phi_4-\frac{26978}{132840}\Phi_2-\frac{20500}{531360}\Phi_1$

$\theta_1=20\Phi_{14}-20\Phi_{13}+20\Phi_4-40\Phi_3+\frac{59200}{132840}\Phi_2-\frac{54400}{531360}\Phi_1$

$\theta_2=10\Phi_{13}-10\Phi_4-\frac{29600}{132840}\Phi_2+\frac{32000}{531360}\Phi_1$

$\zeta=0.05\Phi_{12}+0.0625\Phi_{11}+0.1\Phi_{10}+0.125\,\Phi_9-0.2\Phi_8+0.25\Phi_7+0.5\Phi_6-\Phi_5+0.5\Phi_4-\frac{40262}{132840}\Phi_2+\frac{21566}{531360}\Phi_1$

$\eta=-2\,\Phi_{14}+2\Phi_{13}+0.5\Phi_4+\Phi_3-\frac{31000}{132840}\Phi_2+\frac{33680}{531360}\Phi_1$

Therefore $\mathcal{A}(\mathcal{SL}(2,3^4))=531360\chi_1$

3.2. The results for the group $\mathcal{SL}(2,3^6)$

The character table of rational representations for the group $\mathcal{SL}(2,3^6)$ is

C_g	1	z	c=d	zc=zd	a	a^2	a^4	a^7	a^8	a^{13}	a^{14}	a^{26}
$\|C_g\|$	1	1	265720	265720	532170	532170	532170	532170	532170	532170	532170	532170
$\|C_G(g)\|$	387419760	387419760	1458	1458	728	728	728	728	728	728	728	728
1_G	1	1	1	1	1	1	1	1	1	1	1	1
ψ	729	729	0	0	1	1	1	1	1	1	1	1
χ_1	210240	-210240	288	-288	0	0	-1152	0	1152	0	0	0
χ_2	52560	52560	72	72	0	-144	144	0	0	0	864	1728
χ_4	26280	26280	36	36	-36	36	0	216	216	432	-216	-432
χ_7	35040	-35040	48	-48	0	0	192	288	-192	0	-384	0
χ_8	26280	26280	36	36	36	0	216	-216	-648	-432	-432	0
χ_{13}	17520	-17520	24	-24	0	0	96	0	-96	0	0	-576
χ_{14}	8760	8760	12	12	0	24	-24	-48	-48	0	0	-288
χ_{26}	4380	4380	6	6	0	12	-12	0	0	-72	-72	72
χ_{28}	4380	4380	6	6	6	-6	-12	0	-36	-72	-72	72
χ_{52}	2190	2190	3	3	3	-3	0	-18	-18	18	18	18
χ_{56}	4380	4380	6	6	-6	-12	-36	-72	-72	72	72	72
χ_{91}	2920	-2920	4	-4	0	0	-16	16	16	16	16	16
χ_{104}	2190	2190	3	3	-3	0	-18	18	18	18	18	18
χ_{182}	730	730	1	1	0	-2	2	2	2	2	2	2
θ_1	209664	-209664	-288	288	0	0	0	0	0	0	0	0
θ_2	104832	104832	-144	-144	0	0	0	0	0	0	0	0
θ_5	52416	-52416	-72	72	0	0	0	0	0	0	0	0
θ_{10}	26208	26208	-36	-36	0	0	0	0	0	0	0	0

θ_{73}	2912	-2912	-4	4	0	0	0	0	0	0	0	0
θ_{146}	1456	1456	-2	-2	0	0	0	0	0	0	0	0
ξ	730	730	1	1	-2	2	2	-2	2	-2	2	2
η	1456	-1456	-1	1	0	0	0	0	0	0	0	0

C_g	a^{28}	a^{52}	a^{56}	a^{91}	a^{104}	a^{182}	b^{1}	b^{2}	b^{5}	b^{10}	b^{73}	b^{146}
$\|C_g\|$	**532170**	**532170**	**532170**	**532170**	**532170**	**532170**	**530712**	**530712**	**530712**	**530712**	**530712**	**530712**
$\|C_G(g)\|$	**728**	**728**	**728**	**728**	**728**	**728**	**730**	**730**	**730**	**730**	**730**	**730**
1_G	1	1	1	1	1	1	1	1	1	1	1	1
ψ	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1
χ_1	6912	13824	-6912	0	-13824	0	0	0	0	0	0	0
χ_2	-864	-1738	-1738	0	0	-10368	0	0	0	0	0	0
χ_4	-432	0	-1296	-2592	-2592	2592	0	0	0	0	0	0
χ_7	0	-2304	-2304	2304	2304	2304	0	0	0	0	0	0
χ_8	-1296	-2592	-2592	2592	2592	2592	0	0	0	0	0	0
χ_{13}	-576	576	576	576	576	576	0	0	0	0	0	0
χ_{14}	-288	288	288	288	288	288	0	0	0	0	0	0
χ_{26}	72	72	72	72	72	72	0	0	0	0	0	0
χ_{28}	72	72	72	72	72	72	0	0	0	0	0	0
χ_{52}	18	18	18	18	18	18	0	0	0	0	0	0
χ_{56}	72	72	72	72	72	72	0	0	0	0	0	0
χ_{91}	16	16	16	16	16	16	0	0	0	0	0	0
χ_{104}	18	18	18	18	18	18	0	0	0	0	0	0
χ_{182}	2	2	2	2	2	2	0	0	0	0	0	0
θ_1	0	0	0	0	0	0	-288	-288	-1152	-1152	-20736	20736
θ_2	0	0	0	0	0	0	-144	576	576	1152	10368	20736
θ_5	0	0	0	0	0	0	-72	72	648	-648	5184	-5184
θ_{10}	0	0	0	0	0	0	36	72	-324	432	-2592	-2592
θ_{73}	0	0	0	0	0	0	-4	4	16	-16	-16	-16
θ_{146}	0	0	0	0	0	0	2	4	-8	-8	-8	-8
ξ	2	2	2	-2	2	2	0	0	0	0	0	0
η	0	0	0	0	0	0	4	-4	4	-4	4	-4

The Artincharacter table for the group $\mathcal{SL}(2,3^6)$ is

C_g	1	z	$c=d$	$zc=zd$	a	a^2	a^4	a^7	a^8	a^{13}	a^{14}	a^{26}
$\|C_g\|$	**1**	**1**	**265720**	**265720**	**532170**	**532170**	**532170**	**532170**	**532170**	**532170**	**532170**	**532170**
$\|C_G(g)\|$	**387419760**	**387419760**	**1458**	**1458**	**728**	**728**	**728**	**728**	**728**	**728**	**728**	**728**
Φ_1	387419760	0	0	0	0	0	0	0	0	0	0	0
Φ_2	64569960	64569960	0	0	0	0	0	0	0	0	0	0
Φ_3	531440	0	2	0	0	0	0	0	0	0	0	0
Φ_4	531440	797160	2	2	0	0	0	0	0	0	0	0
Φ_5	532170	1064340	0	0	2	0	0	0	0	0	0	0
Φ_6	1064340	2128680	0	0	0	4	0	0	0	0	0	0
Φ_7	2128680	0	0	0	0	0	8	0	0	0	0	0
Φ_8	3725190	7450380	0	0	0	0	0	14	0	0	0	0
Φ_9	4257360	0	0	0	0	0	0	0	16	0	0	0
Φ_{10}	6918210	13836420	0	0	0	0	0	0	0	26	0	0
Φ_{11}	7450380	0	0	0	0	0	0	0	0	0	28	0
Φ_{12}	13836420	0	0	0	0	0	0	0	0	0	0	52
Φ_{13}	14900760	0	0	0	0	0	0	0	0	0	0	0
Φ_{14}	27672840	0	0	0	0	0	0	0	0	0	0	0
Φ_{15}	29801520	0	0	0	0	0	0	0	0	0	0	0
Φ_{16}	48427470	96854940	0	0	0	0	0	0	0	0	0	0
Φ_{17}	55345680	0	0	0	0	0	0	0	0	0	0	0
Φ_{18}	96854940	0	0	0	0	0	0	0	0	0	0	0
Φ_{19}	1061424	2122848	0	0	0	0	0	0	0	0	0	0
Φ_{20}	2122848	0	0	0	0	0	0	0	0	0	0	0
Φ_{21}	5307120	10614240	0	0	0	0	0	0	0	0	0	0
Φ_{22}	10641240	0	0	0	0	0	0	0	0	0	0	0
Φ_{23}	77483952	154967904	0	0	0	0	0	0	0	0	0	0
Φ_{24}	154967904	0	0	0	0	0	0	0	0	0	0	0

C_H	a^{28}	a^{52}	a^{56}	a^{91}	a^{104}	a^{182}	b^{1}	b^{2}	b^{5}	b^{10}	b^{73}	b^{146}
$\|C_g\|$	532170	532170	532170	532170	532170	532170	530712	530712	530712	530712	530712	530712
$\|C_G(g)\|$	728	728	728	728	728	728	730	730	730	730	730	730
Φ_1	0	0	0	0	0	0	0	0	0	0	0	0
Φ_2	0	0	0	0	0	0	0	0	0	0	0	0
Φ_3	0	0	0	0	0	0	0	0	0	0	0	0
Φ_4	0	0	0	0	0	0	0	0	0	0	0	0
Φ_5	0	0	0	0	0	0	0	0	0	0	0	0
Φ_6	0	0	0	0	0	0	0	0	0	0	0	0
Φ_7	0	0	0	0	0	0	0	0	0	0	0	0
Φ_8	0	0	0	0	0	0	0	0	0	0	0	0
Φ_9	0	0	0	0	0	0	0	0	0	0	0	0
Φ_{10}	0	0	0	0	0	0	0	0	0	0	0	0
Φ_{11}	0	0	0	0	0	0	0	0	0	0	0	0
Φ_{12}	0	0	0	0	0	0	0	0	0	0	0	0
Φ_{13}	56	0	0	0	0	0	0	0	0	0	0	0
Φ_{14}	0	104	0	0	0	0	0	0	0	0	0	0
Φ_{15}	0	0	112	0	0	0	0	0	0	0	0	0
Φ_{16}	0	0	0	182	0	0	0	0	0	0	0	0
Φ_{17}	0	0	0	0	208	0	0	0	0	0	0	0
Φ_{18}	0	0	0	0	0	364	0	0	0	0	0	0
Φ_{19}	0	0	0	0	0	0	2	0	0	0	0	0
Φ_{20}	0	0	0	0	0	0	0	2	0	0	0	0
Φ_{21}	0	0	0	0	0	0	0	0	10	0	0	0
Φ_{22}	0	0	0	0	0	0	0	0	0	20	0	0
Φ_{23}	0	0	0	0	0	0	0	0	0	0	146	0
Φ_{24}	0	0	0	0	0	0	0	0	0	0	0	292

Hence, we written the rational valued characters in the first tables as a linear combination of induced characters in the second table

$$1=\frac{1}{292}\Phi_{24}+\frac{1}{146}\Phi_{23}+\frac{1}{20}\Phi_{22}+\frac{1}{10}\Phi_{21}+\frac{1}{2}\Phi_{20}+\frac{1}{2}\Phi_{19}+\frac{1}{364}\Phi_{18}+\frac{1}{208}\Phi_{17}+\frac{1}{182}\Phi_{16}+\frac{1}{112}\Phi_{15}+\frac{1}{104}\Phi_{14}+\frac{1}{56}\Phi_{13}+\frac{1}{52}\Phi_{12}+\frac{1}{28}\Phi_{11}+\frac{1}{26}\Phi_{10}+\frac{1}{16}\Phi_9+\frac{1}{14}\Phi_8+\frac{1}{8}\Phi_7+\frac{1}{4}\Phi_6+\frac{1}{2}\Phi_5+\frac{1}{2}\Phi_4-\frac{0.0966966838}{64569960}\Phi_2+\frac{0.3200308497}{387419760}\Phi_1$$

$$\Psi=-\frac{1}{292}\Phi_{24}-\frac{1}{146}\Phi_{23}-\frac{1}{20}\Phi_{22}-\frac{1}{10}\Phi_{21}-\frac{1}{2}\Phi_{20}-\frac{1}{2}\Phi_{19}+\frac{1}{364}\Phi_{18}+\frac{1}{208}\Phi_{17}+\frac{1}{182}\Phi_{16}+\frac{1}{112}\Phi_{15}+\frac{1}{104}\Phi_{14}+\frac{1}{56}\Phi_{13}+\frac{1}{52}\Phi_{12}+\frac{1}{28}\Phi_{11}+\frac{1}{26}\Phi_{10}+\frac{1}{16}\Phi_9+\frac{1}{14}\Phi_8+\frac{1}{8}\Phi_7+\frac{1}{4}\Phi_6+\frac{1}{2}\Phi_5-\frac{8241.764477189857}{64569960}\Phi_2-\frac{1.1236073802}{387419760}\Phi_1$$

$$\chi_1=-66.46154\Phi_{17}-61.71429\Phi_{15}-132.923077\Phi_{14}+123.42857\Phi_{13}+72\Phi_9-144\Phi_7-144\Phi_4+288\Phi_3+\frac{114580800}{64569960}\Phi_2-\frac{18386930802050}{387419760}\Phi_1$$

$$\chi_2=-28.48352\Phi_{18}-15.51786\Phi_{15}-16.71154\Phi_{14}-15.42857\Phi_{13}+33.23077\Phi_{12}+30.85714\Phi_{11}+18\Phi_7-36\Phi_6+36\Phi_4+\frac{47987280}{64569960}\Phi_2+\frac{8.6823907941}{387419760}\Phi_1$$

$$\chi_4=7.12088\Phi_{18}-12.46154\Phi_{17}-14.24176\Phi_{16}-11.57143\Phi_{15}-7.71429\Phi_{13}-8.30769\Phi_{12}-7.71429\Phi_{11}+16.61538\Phi_{10}+13.5\Phi_9+15.42858\Phi_8+9\Phi_6-18\Phi_5+18\Phi_4-\frac{26.9251145625}{64569960}\Phi_2+\frac{7.1480607026}{387419760}\Phi_1$$

$$\chi_7=6.32967\Phi_{18}+11.7692\Phi_{17}+12.65934\Phi_{16}-20.57143\Phi_{15}-22.15385\Phi_{14}-13.71429\Phi_{11}-12\Phi_9+20.57143\Phi_8+24\Phi_7-24\Phi_4+48\Phi_3-\frac{21.0668829094}{64569960}\Phi_2+\frac{1.6918333266}{387419760}\Phi_1$$

$$\chi_8=7.12088\Phi_{18}+12.46154\Phi_{17}+14.24176\Phi_{16}-23.14296\Phi_{15}-24.92308\Phi_{14}-23.14286\Phi_{13}-15.42857\Phi_{11}-16.61538\Phi_{10}-40.5\Phi_9-15.42857\Phi_8+27+18\Phi_5+18\Phi_4-\frac{20.1009395625}{64569960}\Phi_2+\frac{3.1524636323}{387419760}\Phi_1$$

$$\chi_{13}=1.58242\Phi_{18}+2.76923\Phi_{17}+3.16484\Phi_{16}+5.14286\Phi_{15}+5.53846\Phi_{14}-10.28571\Phi_{13}-11.07692\Phi_{12}-6\Phi_9+12\Phi_7-12\Phi_4-24\Phi_3+\frac{3171120}{64569960}\Phi_2-\frac{0.8158105289}{387419760}\Phi_1$$

$$\chi_{14}=0.79121\Phi_{18}+1.38462\Phi_{17}+1.58242\Phi_{16}+2.57143\Phi_{15}+2.76923\Phi_{14}-5.14286\Phi_{13}-5.53846\Phi_{12}-3\Phi_9-3.42857\Phi_8-3\Phi_7+6\Phi_6+6\Phi_4-\frac{132495245}{64569960}\Phi_2-\frac{75038410}{387419760}\Phi_1$$

χ_{26}=0.19780 Φ_{18}+0.34615Φ_{17}+0.39560 Φ_{16} +0.64286 Φ_{15}+0.692308 Φ_{14} −1.28571Φ_{13} +1.38462Φ_{12} −2.57143Φ_{11} −2.76923Φ_{10} −1.5Φ_7+3Φ_6+3 $\Phi_4 - \frac{0.135863874}{64569960}\Phi_2 - \frac{1.1127652965}{387419760}\Phi_1$

χ_{28} =0.19780Φ_{18} +0.34615Φ_{17} +0.39560Φ_{16} +0.64286 Φ_{15}+0.692308 Φ_{14}-1.28571Φ_{13} +1.38462Φ_{12} −2.57143Φ_{11} −2.76923Φ_{10} −2.25 Φ_9 − 1.5Φ_7 +1.5Φ_6+3Φ_5+3 $\Phi_4 + \frac{1.1498372249}{64569960}\Phi_2 - \frac{0.4100273676}{387419760}\Phi_1$

χ_{52} =0.49451 Φ_{18} +0.08654Φ_{17} +0.09890 Φ_{16} +0.16071 Φ_{15}+0.17308 Φ_{14}+0.32143Φ_{13}+0.34615Φ_{12}+0.64286Φ_{11}+0.69231Φ_{10} −1.125 Φ_9 − 1.28571Φ_8 − 0.75$\Phi_6$1.5Φ_5 +1.5 $\Phi_4 - \frac{0.1668355908}{64569960}\Phi_2 - \frac{0.1609208234}{387419760}\Phi_1$

χ_{56}=0.19780 Φ_{18}+0.34615Φ_{17} +0.39560 Φ_{16} +0.64286 Φ_{15} +0.692308 Φ_{14} −1.28571Φ_{13}+1.38462Φ_{12} +2.57143Φ_{11}+2.76923Φ_{10} −4.5 Φ_9 − 5.14286Φ_8 −4.5Φ_7 −3Φ_6-3Φ_5+3 $\Phi_4 - \frac{0.4820170608}{64569960}\Phi_2 - \frac{0.0844818731}{387419760}\Phi_1$

χ_{91} =0.04396 Φ_{18}+0.07692Φ_{17}+0.08791 Φ_{16}+0.14286 Φ_{15} +0.15385 Φ_{14}+0.28571Φ_{13}+0.30769Φ_{12}+0.57143Φ_{11} +0.61538Φ_{10} + Φ_9+1.4286Φ_8 −2 Φ_7 −2 Φ_4+4Φ_3 − $\frac{0.3709544686}{64569960}\Phi_2 - \frac{0.0508008205}{387419760}\Phi_1$

χ_{104}=0.49451 Φ_{18}+0.08654Φ_{17}+0.09890 Φ_{16}+0.16071 Φ_{15} +0.17308 Φ_{14}+0.32143Φ_{13}+0.34615Φ_{12}+0.64286Φ_{11}+0.69231Φ_{10} −1.125 Φ_9+1.28571Φ_8 −2.25Φ_7 −1.5Φ_5+1.5Φ_4 − $\frac{0.1421103161}{64569960}\Phi_2 - \frac{0.1753438179}{387419760}\Phi_1$

χ_{182}=0.00549Φ_{18}+0.00962Φ_{17}+0.01099Φ_{16}+0.01786Φ_{15} +0.01923Φ_{14}+0.03571Φ_{13}+0.03846 Φ_{12} +0.7143Φ_{11} +0.7692Φ_{10}+0.125Φ_9+0.14286Φ_8 +0.25Φ_7 −0.5Φ_5+0.5Φ_4 − $\frac{0.0391297208}{64569960}\Phi_2$ − $\frac{0.0092718584}{387419760}\Phi_1$

θ_1 =71.01369Φ_{24} −142.02739Φ_{23} −57.6Φ_{22} −115.2Φ_{21} −144Φ_{20} −144Φ_{19} +144Φ_4 −28Φ_3 + $\frac{345.7201583351}{64569960}\Phi_2 - \frac{53.4348626927}{387419760}\Phi_1$

θ_2 =71.01369Φ_{24} +71.01369Φ_{23} +57.6Φ_{22} +57.6Φ_{21} +288Φ_{20} −72Φ_{19} −144Φ_4 − $\frac{175.7548245439}{64569960}\Phi_2 - \frac{16.8699012443}{387419760}\Phi_1$

θ_5 = −17.75342Φ_{24}+35.50685Φ_{23} −32.4Φ_{22}+648Φ_{21} +36Φ_{20} −36Φ_{19} −72Φ_3 − $\frac{192.9213613597}{64569960}\Phi_2$ − $\frac{40.3373349903}{387419760}\Phi_1$

θ_{10} = −8.87672Φ_{24} −17.75342Φ_{23}+21.6Φ_{22} −32.4Φ_{21}+36Φ_{20} +18Φ_{19} −36Φ_4 + $\frac{47.7873049051}{64569960}\Phi_2$ − $\frac{8.0788241774}{387419760}\Phi_1$

θ_{73} = −0.05479Φ_{24} − 0.10959Φ_{23} −0.8Φ_{22}+1.6Φ_{21} +2Φ_{20} − 2Φ_{19} −2Φ_4 −4Φ_3 − $\frac{0.0411048327}{64569960}\Phi_2 - \frac{0.0014069516}{387419760}\Phi_1$

θ_{146} = −0.02739Φ_{24} −0.05479Φ_{23} −0.4Φ_{22} −0.8Φ_{21} +2Φ_{20} + Φ_{19} −2Φ_4 + $\frac{2.548400442}{64569960}\Phi_2$ − $\frac{0.0095650435}{387419760}\Phi_1$

ζ=0.00549Φ_{18} +0.00962Φ_{17} − 0.01099Φ_{16}+0.01786Φ_{15}+0.01923Φ_{14}+0.03571Φ_{13} +0.03846Φ_{12}+0.07142Φ_{11} −0.07692Φ_{10}+0.125Φ_9 −1014286 Φ_8+0.25Φ_7+0.5Φ_6 − Φ_5 + Φ_4 + $\frac{0.0371173299}{64569960}\Phi_2 - \frac{0.014421012}{387419760}\Phi_1$

$\eta = -0.01369\Phi_{24} + 0.02739\Phi_{23} + 0.2\Phi_{22} + 0.4\Phi_{21} - 2\Phi_{20} + 2\Phi_{19} + 0.5\Phi_4 - \Phi_3 - \frac{0.203438238}{64569960}\Phi_2 + \frac{0.0279008248}{387419760}\Phi_1$

Therefore $\mathcal{A}(\mathcal{SL}(2,3^6)) = 387419760\chi_1$

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