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Accounts For The Groups SL(2,U), U = 41 and 43

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ABSTRACT

The circular retail for the groups $\mathcal{SL}(2,\mathfrak{U})$ where $\mathfrak{U}$ = 41 and 43 was compute in this paper from the ordinary character table and the character table (ch.t.) of rational representations (r.rep.) for each group.

1. Introduction

The $\mathcal{SL}(n,F)$ is the subgroup of $G\mathcal{L}(n,F)$ which contains all matrices of determinant one over the field F, [7,9]. By using the intellect which the authors gave it in [1,3-5,8,10-12], we find the circular retail for the groups $\mathcal{SL}(2,\mathfrak{U})$ where $\mathfrak{U}$ = 41 and 43.

2- Elementary Concepts

In this section some facts were mentioned.

Theorem 2.1: [6]

If G is any cyclic P–group, then $K(G) = Z_p$.

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Theorem 2.2: [6]

If G is any cyclic group of order Pn, then $K(G) = \overset{n}{\underset{i=1}{\oplus}} Z_{p^i}$.

Theorem 2.3: [2]

$|\mathcal{SL}(2,p^k)| = p^k(p^{2k} - 1)$.

3. Primary account

We using the notion in [1,3-5,8,10-12] to find the circular retail for $\mathcal{SL}(2,\mathfrak{U})$ where $\mathfrak{U} = 41$ and 43.

3.1 The account for $\mathcal{SL}(2,41)$

$|\mathcal{SL}(2,41)| = 68880.$

The (ch.t.) of (r.rep.) for $\mathcal{SL}(2,41)$ is

C_g	1	z	c	zc	a	a^2	a^4	b	b^2	b^3	b^6
$\|C_g\|$	1	1	840	840	1722	1722	1722	1640	1640	1640	1640
$\|C_G(g)\|$	68880	68880	82	82	40	40	40	42	42	42	42
1_G	1	1	1	1	1	1	1	1	1	1	1
Ψ	41	41	0	0	1	1	1	-1	-1	-1	-1
$\chi_1+\chi_3+\chi_5+\chi_7+\chi_9+\chi_{11}+\chi_{13}+\chi_{15}+\chi_{17}+\chi_{19}$	420	-420	10	-10	0	0	0	0	0	0	0
$\chi_2+\chi_4+\chi_6+\chi_8+\chi_{12}+\chi_{14}+\chi_{16}+\chi_{18}$	336	336	8	8	0	0	-4	0	0	0	0
χ_{10}	42	42	1	1	0	-2	2	0	0	0	0
$\theta_1+\theta_3+\theta_5+\theta_9+\theta_{11}+\theta_{13}+\theta_{15}+\theta_{17}+\theta_{19}$	320	-320	-8	8	0	0	0	0	0	-3	3
θ_7	40	-40	-1	1	0	0	0	0	0	3	-3
$\theta_2+\theta_4+\theta_6+\theta_8+\theta_{10}+\theta_{12}+\theta_{16}+\theta_{18}+\theta_{20}$	360	360	-9	-9	0	0	0	-1	1	2	2
θ_{14}	40	40	-1	-1	0	0	0	1	1	-2	-2
$\xi_1+\xi_2$	42	42	1	1	-2	2	2	0	0	0	0
$\eta_1+\eta_2$	-40	-40	-1	-1	0	0	0	2	-2	2	-2

The diagonalization matrix of it is

$$\begin{pmatrix} 68880 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -17220 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 5 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -4 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 7 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 6 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -7 \end{pmatrix}$$

Thus

$K(\mathcal{SL}(2,41)) = Z_{68880} \oplus Z_{17220} \oplus Z_4 \oplus Z_2 \oplus Z_5 \oplus Z_4 \oplus Z_7 \oplus Z_2 \oplus Z_6 \oplus Z_1 \oplus Z_7$

3.2 The account for $\mathcal{SL}(2,43)$

$|\mathcal{SL}(2,43)| = 79464$.

The (ch.t.) of (r.rep.) for $\mathcal{SL}(2,43)$ is

C_g	1	z	c	zc	a	a^2	a^3	a^6	b	b^2	b^4
$\|C_g\|$	1	1	924	924	1892	1892	1892	1892	1806	1806	1806
$\|C_G(g)\|$	79464	79464	86	86	42	42	42	42	44	44	44
1_G	1	1	1	1	1	1	1	1	1	1	1
Ψ	43	43	0	0	1	1	1	1	-1	-1	-1
$\chi_1+\chi_3+\chi_5+\chi_7+\chi_9+\chi_{11}+\chi_{13}+\chi_{15}+\chi_{17}+\chi_{19}$	396	-396	9	-9	0	0	3	-3	0	0	0
χ_7	44	-44	1	-1	1	-1	-2	2	0	0	0
$\chi_2+\chi_4+\chi_6+\chi_8+\chi_{10}+\chi_{12}+\chi_{16}+\chi_{18}+\chi_{20}$	396	396	9	9	0	0	-3	-3	0	0	0
χ_{14}	44	44	1	1	-1	-1	2	2	0	0	0
$\theta_1+\theta_3+\theta_5+\theta_9+\theta_{11}+\theta_{13}+\theta_{15}+\theta_{17}+\theta_{19}+\theta_{21}$	420	-420	-10	10	0	0	0	0	0	-2	2
θ_{11}	42	-42	-1	1	0	0	0	0	0	2	-2
$\theta_2+\theta_4+\theta_6+\theta_8+\theta_{10}+\theta_{12}+\theta_{16}+\theta_{18}+\theta_{20}$	420	420	-10	-10	0	0	0	0	0	2	2
$\xi_1+\xi_2$	44	-44	1	-1	-2	2	-2	2	0	0	0
$\eta_1+\eta_2$	42	42	-1	-1	0	0	0	0	2	-2	-2

The diagonalization matrix of it is

$$\begin{pmatrix} 79464 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -19866 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 7 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -4 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 11 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -2 \end{pmatrix}$$

Thus

$K(\mathcal{SL}(2,43)) = Z_{79464} \oplus Z_{19866} \oplus Z_2 \oplus Z_7 \oplus Z_2 \oplus Z_4 \oplus Z_2 \oplus Z_{11} \oplus Z_1 \oplus Z_3 \oplus Z_2$

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