able A.17. The characters of the binary dihedral group, n even

Character χ_i	Conjugacy class $Cl(g)$ and its order under it				
	$Cl(1)$	$Cl(-1)$	$Cl(a^k)$ for $k=1,\ldots,n-1$	$Cl(b)$	$Cl(ba)$
	1	1	2	n	n
χ_1	1	1	1	1	1
χ_2	1	1	1	-1	-1
χ_3	1	-1	$(-1)^k$	i	$-i$
χ_4	1	-1	$(-1)^k$	$-i$	i
χ'_1	2	-2	$\xi^k+\xi^{-k}$	0	0
χ'_2	2	2	$\xi^{2k}+\xi^{-2k}$	0	0
...	...	...	...	...	...
χ'_{n-1}	2	$(-2)^{n-1}$	$\xi^{k(n-1)}+\xi^{-k(n-1)}$	0	0

able A.18. The characters of the binary dihedral group, n odd

Character χ_i	Conjugacy class $Cl(g)$ and its order under it				
	$Cl(1)$	$Cl(-1)$	$Cl(a^k)$ for $k=1,\ldots,n-1$	$Cl(b)$	$Cl(ba)$
	1	1	2	n	n
χ_1	1	1	1	1	1
χ_2	1	1	1	-1	-1
χ_3	1	-1	$(-1)^k$	1	-1
χ_4	1	-1	$(-1)^k$	-1	1
χ'_1	2	-2	$\xi^k+\xi^{-k}$	0	0
χ'_2	2	2	$\xi^{2k}+\xi^{-2k}$	0	0
...	...	...	...	...	...
χ'_{n-1}	2	$(-2)^{n-1}$	$\xi^{k(n-1)}+\xi^{-k(n-1)}$	0	0

$$R^2 = S^n = T^2 = RST = -1, \tag{A.67}$$

(A.5) holds for $\langle 2,2,n\rangle$.
characters of the binary dihedral group $\mathcal{D}$ are given in Table A.17 (n and Table A.18 (n is odd). In these tables ξ is a primitive $2n$-th root

A.6.3 The binary icosahedral group

The binary icosahedral group $\mathcal{J}$ has the presentation:

$$\mathcal{J} = \{a, b \mid a^5 = b^3 = (ba)^2 = -1\}. \tag{A.68}$$

Table A.19. The characters of the binary icosahedral group

Character χ_i	The conjugacy class $Cl(g)$ and its order (under it)								
	$Cl(1)$	$Cl(-1)$	$Cl(a)$	$Cl(a^2)$	$Cl(a^3)$	$Cl(a^4)$	$Cl(b)$	$Cl(b^2)$	$Cl(ab)$
	1	1	12	12	12	12	20	20	30
χ_1	1	1	1	1	1	1	1	1	1
χ_2	2	-2	μ^+	$-\mu^-$	μ^-	$-\mu^+$	1	-1	0
χ_3	2	-2	μ^-	$-\mu^+$	μ^+	$-\mu^-$	1	-1	0
χ_4	3	3	μ^+	μ^-	μ^-	μ^+	0	0	-1
χ_5	3	3	μ^-	μ^+	μ^+	μ^-	0	0	-1
χ_6	4	-4	1	-1	1	-1	-1	1	0
χ_7	4	4	-1	-1	-1	-1	1	1	0
χ_8	5	5	0	0	0	0	-1	-1	1
χ_9	6	-6	-1	1	-1	1	0	0	0
e.values	2	-2	μ^+	$-\mu^-$	μ^-	$-\mu^+$	1	-1	0

By setting

$$R := b, S := a, T := ba,$$

we deduce that presentation (A.68) is equivalent to the following presentation:

$$R^3 = S^5 = T^2 = RST = -1, \tag{A.69}$$

i.e., eq. (A.5) holds for $\langle 2,3,5\rangle$.
Let μ^+, μ^- be as follows:

$$\mu^+ = \frac{1}{2}(1+\sqrt{5}), \text{ and } \mu^- = \frac{1}{2}(1-\sqrt{5}).$$

The characters of the binary icosahedral group $\mathcal{J}$ are given in Table A.19.