

2. ISOMORPHIC GROUPS

There are several families of groups, many members of which may not appear in this catalogue. However they do appear under other names. The following table shows the members of these families, their preferred name, and their number in the catalogue. Groups of orders 64 and 96 are omitted.

DIHEDRAL GROUPS: $D_{2n} = \langle A^n, B^2, BA = A^{-1}B \rangle$

<i>n</i>	No	NAME	<i>n</i>	No	NAME
2	2.1	2	52	52.3	$D_{26} \times 2$
4	4.2	2^2	54	54.15	D_{54}
6	6.2	D_6	56	56.08	D_{56}
8	8.4	D_8	58	58.2	D_{58}
10	10.2	D_{10}	60	60.09	$D_{30} \times 2$
12	12.3	$D_6 \times 2$	62	62.2	D_{62}
14	14.2	D_{14}	66	66.4	D_{66}
16	16.12	D_{16}	68	68.3	$D_{34} \times 2$
18	18.5	D_{18}	70	70.4	D_{70}
20	20.3	$D_{10} \times 2$	72	72.40	D_{72}
22	22.2	D_{22}	74	74.2	D_{74}
24	24.12	D_{24}	76	76.3	$D_{38} \times 2$
26	26.2	D_{26}	78	78.6	D_{78}
28	28.3	$D_{14} \times 2$	80	80.49	D_{80}
30	30.4	D_{30}	82	82.2	D_{82}
32	32.49	D_{32}	84	84.12	$D_{42} \times 2$
34	34.2	D_{34}	86	86.2	D_{86}
36	36.11	$D_{18} \times 2$	88	88.11	D_{88}
38	38.2	D_{38}	90	90.10	D_{90}
40	40.13	D_{40}	92	92.3	$D_{46} \times 2$
42	42.6	D_{42}	94	94.2	D_{94}
44	44.3	$D_{22} \times 2$	98	98.5	D_{98}
46	46.2	D_{46}	100	100.10	$D_{50} \times 2$
48	48.42	D_{48}			
50	50.5	D_{50}			

DICYCLIC GROUPS: $Q_{4n} = \langle A^{2n}, B^2 = A^n, BA = A^{-1}B \rangle$

n	No	NAME
1	4.2	2^2
2	8.5	Q_8
3	12.4	$D_{3,4}$
4	16.14	Q_{16}
5	20.4	$D_{5,4}$
6	24.13	Q_{24}
7	28.4	$D_{7,4}$
8	32.51	Q_{32}
9	36.12	$D_{9,4}$
10	40.14	Q_{40}
11	44.4	$D_{11,4}$
12	48.44	Q_{48}
13	52.4	$D_{13,4}$
14	56.12	Q_{56}
15	60.10	$D_{15,4}$
17	68.4	$D_{17,4}$
18	72.41	Q_{72}
19	76.4	$D_{19,4}$
20	80.51	Q_{80}
21	84.13	$D_{21,4}$
22	88.12	Q_{88}
23	92.4	$D_{23,4}$
25	100.11	$D_{25,4}$

**GENERALISED DIHEDRAL GROUPS: $D_{m,n} = \langle A^m, B^n, BA = A^{-1}B \rangle$
where m is even**

$D_{4,2^n m} = D_{4,2^n} \times m$ where m is odd. If m is odd $D_{2m,n} = D_{m,n} \times 2$.

m	n	No	NAME
3	4	12.4	$D_{3,4}$
	6	18.3	$D_6 \times 3$
	8	24.09	$D_{3,8}$
	10	30.2	$D_6 \times 5$
	12	36.06	$D_{3,4} \times 3$
	14	42.2	$D_6 \times 7$
	16	48.21	$D_{3,16}$
	18	54.07	$D_6 \times 9$
	20	60.04	$D_{3,4} \times 5$
	22	66.2	$D_6 \times 11$
	24	72.14	$D_{3,8} \times 3$
	26	78.2	$D_6 \times 13$
	28	84.04	$D_{3,4} \times 7$
	30	90.03	$D_6 \times 15$
4	4	16.10	$D_{4,4}$
	6	24.04	$D_8 \times 3$
	8	32.21	$D_{4,8}$
	10	40.04	$D_8 \times 5$
	12	48.10	$D_{4,4} \times 3$
	14	56.04	$D_8 \times 7$
	18	72.09	$D_8 \times 9$
	20	80.10	$D_{4,4} \times 5$
	22	88.04	$D_8 \times 11$
5	4	20.4	$D_{5,4}$
	6	30.3	$D_{10} \times 3$
	8	40.09	$D_{5,8}$
	10	50.3	$D_{10} \times 5$
	12	60.07	$D_{5,4} \times 3$
	14	70.2	$D_{10} \times 7$
	16	80.21	$D_{5,16}$
	18	90.07	$D_{10} \times 9$
	20	100.06	$D_{5,4} \times 5$

m	n	No	NAME
6	4	24.08	$D_{3,4} \times 2$
	6	36.05	$D_{12} \times 3$
	8	48.20	$D_{3,8} \times 2$
	10	60.03	$D_6 \times 10$
	12	72.12	$D_{3,4} \times 6$
	14	84.03	$D_{12} \times 7$
7	4	28.4	$D_{7,4}$
	6	42.3	$D_{14} \times 3$
	8	56.09	$D_{7,8}$
	10	70.3	$D_{7,10}$
	12	84.07	$D_{7,4} \times 3$
	14	98.3	$D_{14} \times 7$
8	4	32.29	$D_{8,4}$
	6	48.12	$D_{16} \times 3$
	10	80.12	$D_{16} \times 5$
9	4	36.12	$D_{9,4}$
	6	54.09	$D_{18} \times 3$
	8	72.24	$D_{9,8}$
	10	90.05	$D_{18} \times 5$
10	4	40.08	$D_{5,4} \times 2$
	6	60.06	$D_{10,6}$
	8	80.36	$D_{10,8}$
	10	100.05	$D_{10} \times 10$
11	4	44.4	$D_{11,4}$
	6	66.3	$D_{22} \times 3$
	8	88.09	$D_{11,8}$
12	4	48.39	$Q_8 \times D_6$
	6	72.76	$D_{24} \times 3$
13	4	52.4	$D_{13,4}$
	6	78.3	$D_{26} \times 3$
14	4	56.08	D_{56}
	6	84.06	$D_{28} \times 3$

<i>m</i>	<i>n</i>	No	NAME
15	4	60.10	$\mathbf{D}_{15,4}$
	6	90.08	$\mathbf{D}_{30} \times 3$
17	4	68.3	$\mathbf{D}_{34} \times 2$
18	4	42.3	$\mathbf{D}_{14} \times 3$
19	4	76.4	\mathbf{D}_{76}
20	4	70.3	$\mathbf{D}_{14} \times 5$
21	4	84.13	$\mathbf{D}_{21,4}$
22	4	88.08	$\mathbf{D}_{11,4} \times 2$
23	4	92.4	\mathbf{Q}_{92}
25	4	100.11	$\mathbf{D}_{25,4}$

METACYCLIC GROUPS: $M_{m,n}^{(k)} = \langle A^m, B^n, BA = A^k B \rangle$

m	n	k	No	NAME
5	4	2	20.5	$M_{5,4}^{(2)}$
		3	20.5	$M_{5,4}^{(2)}$
	8	2	40.11	$M_{5,8}^{(2)}$
		3	40.11	$M_{5,8}^{(2)}$
	12	2	60.08	$M_{5,4}^{(3)} \times 3$
		3	60.08	$M_{5,4}^{(3)} \times 3$
	16	2	80.26	$M_{5,16}^{(2)}$
		3	80.26	$M_{5,16}^{(2)}$
	20	2	100.07	$M_{5,4}^{(2)} \times 5$
		3	100.07	$M_{5,4}^{(2)} \times 5$
7	3	2	21.2	$M_{7,3}^{(2)}$
		4	21.2	$M_{7,3}^{(2)}$
	6	2	42.2	$M_{7,3}^{(2)} \times 2$
		3	42.5	$M_{7,6}^{(3)}$
		4	42.2	$M_{7,3}^{(2)} \times 2$
		5	42.5	$M_{7,6}^{(3)}$
	9	2	63.4	$M_{7,9}^{(2)}$
		4	63.4	$M_{7,9}^{(2)}$
	12	2	84.09	$M_{7,3}^{(4)} \times 4$
		3	84.11	$M_{7,12}^{(3)}$
		4	84.09	$M_{7,3}^{(4)} \times 4$
		5	84.11	$M_{7,12}^{(3)}$
8	2	3	16.13	$M_{8,2}^{(3)}$
		5	16.11	$M_{8,2}^{(5)}$
	4	3	32.30	$M_{8,4}^{(3)}$
		5	32.19	$M_{8,2}^{(5)}$
	6	3	48.13	$M_{8,2}^{(3)} \times 3$
		5	48.13	$M_{8,2}^{(3)} \times 3$
	10	3	80.13	$M_{8,2}^{(3)} \times 5$
		5	80.11	$M_{8,2}^{(5)} \times 5$
9	3	4	27.2	$M_{9,3}^{(4)}$
		7	27.2	$M_{9,3}^{(4)}$
	6	2	54.12	$M_{9,6}^{(2)}$
		4	54.05	$M_{9,3}^{(4)} \times 2$
		5	54.09	$D_{18} \times 3$
		7	54.05	$M_{9,3}^{(4)} \times 2$
	9	4	81.09	$M_{9,9}^{(4)}$
		7	81.09	$M_{9,9}^{(4)}$

m	n	k	No	NAME
10	4	3	40.10	$M_{5,4}^{(3)} \times 2$
		7	40.10	$M_{5,4}^{(3)} \times 2$
	8	3	80.24	$M_{10,8}^{(3)}$
		7	80.24	$M_{10,8}^{(3)}$
11	5	3	55.2	$M_{11,5}^{(3)}$
		4	55.2	$M_{11,5}^{(3)}$
		5	55.2	$M_{11,5}^{(3)}$
		9	55.2	$M_{11,5}^{(3)}$
12	2	5	24.07	$D_6 \times 4$
		7	24.04	$D_8 \times 3$
	4	5	48.39	$Q_8 \times D_6$
		7	48.39	$Q_8 \times D_6$
	6	5	72.13	$D_6 \times 12$
		7	72.07	$D_8 \times 3^2$
13	3	3	39.2	$M_{13,3}^{(3)}$
		9	39.2	$M_{13,3}^{(3)}$
	4	5	57.5	$M_{13,4}^{(5)}$
		8	57.5	$M_{13,4}^{(5)}$
	6	3	39.2	$M_{13,3}^{(3)} \times 2$
		4	78.5	$M_{13,6}^{(4)}$
		9	39.2	$M_{13,3}^{(3)} \times 2$
		10	78.5	$M_{13,6}^{(4)}$
14	3	9	42.4	$M_{7,3}^{(2)} \times 2$
		11	42.4	$M_{7,3}^{(2)} \times 2$
	6	3	84.10	$M_{7,6}^{(5)} \times 2$
		5	84.10	$M_{7,6}^{(5)} \times 2$
		9	84.08	$M_{7,3}^{(4)} \times 3^2$
		11	84.08	$M_{7,3}^{(4)} \times 3^2$
15	2	4	30.3	$D_{10} \times 3$
		11	30.2	$D_6 \times 5$
	4	2	60.12	$M_{15,4}^{(2)}$
		4	60.07	$D_{5,4} \times 3$
		7	60.08	$M_{5,4}^{(3)} \times 3$
		8	60.12	$M_{15,4}^{(2)}$
		11	60.04	$D_{3,4} \times 5$
		13	60.08	$M_{5,4}^{(3)} \times 3$
	6	4	90.06	$D_{10} \times 3^2$
		11	90.03	$D_6 \times 15$
16	2	7	32.50	$M_{16,2}^{(7)}$
		9	32.22	$M_{16,2}^{(9)}$

<i>m</i>	<i>n</i>	<i>k</i>	No	NAME
17	4	4	68.5	$M_{17,4}^{(4)}$
		13	68.5	$M_{17,4}^{(4)}$
18	3	7	54.5	$M_{9,3}^{(4)} \times 3$
		13	54.5	$M_{9,3}^{(4)} \times 3$
19	3	7	57.2	$M_{19,3}^{(7)}$
		11	57.2	$M_{19,3}^{(7)}$
20	2	9	40.07	$D_{10} \times 4$
		11	40.04	$D_8 \times 5$
	4	3	80.23	$M_{5,4}^{(3)} \times 4$
		7	80.23	$M_{5,4}^{(3)} \times 4$
		9	80.18	$D_{5,4} \times 4$
		11	80.06	$D_8 \times 10$
		13	80.23	$M_{5,4}^{(3)} \times 4$
		17	80.23	$M_{5,4}^{(3)} \times 4$
21	2	8	42.2	$D_6 \times 7$
		13	42.3	$D_{14} \times 3$
	3	4	63.3	$M_{7,3}^{(2)} \times 3$
		16	63.3	$M_{7,3}^{(2)} \times 3$
	4	8	84.04	$D_{3,4} \times 7$
		13	84.07	$D_{7,4} \times 13$
24	2	5	48.33	$M_{24,2}^{(5)}$
		7	48.12	$D_{16} \times 3$
		11	48.11	$M_{8,2}^{(5)} \times 3$
		13	48.11	$M_{8,2}^{(5)} \times 3$
		17	48.11	$M_{8,2}^{(5)} \times 3$
		19	48.13	$M_{8,2}^{(3)} \times 3$
25	4	7	100.16	$M_{25,4}^{(7)}$
		18	100.16	$M_{25,4}^{(7)}$
26	3	3	78.4	$M_{13,3}^{(9)} \times 2$
		9	78.4	$M_{13,3}^{(9)} \times 2$
27	3	10	81.11	$M_{27,3}^{(10)}$
		19	81.11	$M_{27,3}^{(10)}$
28	2	13	56.7	$D_{14} \times 4$
		15	56.4	$D_8 \times 7$
	3	9	84.9	$M_{7,3}^{(4)} \times 4$
		25	84.9	$M_{7,3}^{(4)} \times 4$

<i>m</i>	<i>n</i>	<i>k</i>	No	NAME
30	2	11	60.03	$D_6 \times 10$
		19	60.06	$D_{10} \times 6$
31	3	5	93.2	$M_{31,3}^{(5)}$
		25	93.2	$M_{31,3}^{(5)}$
33	2	10	66.3	$D_{22} \times 3$
		23	66.2	$D_6 \times 11$
35	2	6	70.3	$D_{14} \times 5$
		29	70.2	$D_{10} \times 7$
36	2	17	72.23	$D_{18} \times 4$
		19	72.09	$D_8 \times 9$
39	2	14	78.2	$D_6 \times 13$
		25	78.3	$D_{26} \times 3$
40	2	9	80.19	$D_{10} \times 8$
		11	80.13	$M_{8,2}^{(3)} \times 5$
		19	80.50	$M_{40,2}^{(19)}$
		21	80.11	$M_{40,2}^{(21)}$
		29	80.19	$D_{10} \times 8$
		31	80.12	$D_{16} \times 5$
42	2	13	84.06	$D_{28} \times 3$
		29	84.03	$D_6 \times 14$
44	2	21	88.07	$D_{22} \times 4$
		23	88.04	$D_8 \times 11$
45	2	19	90.07	$D_{10} \times 9$
		26	90.05	$D_{18} \times 5$

SYMMETRIC GROUPS: S_n

n	No	NAME
2	2.1	S_2
3	6.2	D_6
4	24.15	S_4

ALTERNATING GROUPS: A_n

n	No	NAME
3	3.1	A_3
4	12.5	A_4
5	60.13	A_5

GENERAL LINEAR GROUPS: $GL_{n,q}$
 $= \{n \times n \text{ invertible matrices over } GF(q)\}$

n	q	No	NAME
2	2	6.2	D_6
	3	48.49	$GL_{2,3}$

SPECIAL LINEAR GROUPS: $SL_{n,q} = \{M \in GL_{n,q} \mid |M| = 1\}$

n	q	No	NAME
2	2	6.2	D_6
	3	24.14	$SL_{2,3}$
	4	60.13	A_5

PROJECTIVE SPECIAL LINEAR GROUPS: $PSL_{n,q} = SL_{n,q}/Z(SL_{n,q})$

n	q	No	NAME
2	2	6.2	D_6
	3	12.5	A_4
	4	60.13	A_5

DIRECT PRODUCTS

This table shows that the collection of groups in this catalogue is closed under direct products, apart from groups of orders 64 and 96 and groups whose order is over 100.

×	2							
2	4.2	3						
3	6	9.2	4					
4	8.2	12	16.03	4.2				
4.2	8.3	12.2	16.04	16.05	5			
5	10	15	20	20.2	25.2	6		
6	12.2	18.2	24.1	24.03	30	36.04	6.2	
6.2	12.3	18.3	24.07	24.06	30.2	36.05	36.13	7
7	14	21	28	28.2	35	42	42.2	49.2
8	16.02	24	32.03	32.04	40	48.02	48.19	56
8.2	16.04	24.02	32.05	32.06	40.02	48.04	48.16	56.02
8.3	16.05	24.03	32.06	32.07	40.03	48.05	48.15	56.03
8.4	16.06	24.04	32.14	32.08	40.04	48.06	48.38	56.04
8.5	16.07	24.05	32.15	32.09	40.05	48.07	48.39	56.05
9	18	27.2	36	36.02	45	54.03	54.07	63
9.2	18.2	27.3	36.	36.04	45.1	54.03	54.06	63.1
10	20.2	30	40.02	40.03	50.2	60.02	60.03	70.1
10.2	20.??	30.3	40.07	40.06	50.3	60.06	60.11	70.2
11	22	33	44	44.2	55	66	66.2	77
12	24.02	36.03	48.03	48.04	60	72.05	72.13	84
12.2	24.03	36.04	48.04	48.05	60.02	72.06	72.11	84.02
12.3	24.06	36.05	48.16	48.15	60.03	72.11	72.31	84.0
12.4	24.08	36.06	48.18	48.17	60.04	72.12	72.32	84.04
12.5	24.10	36.07	48.23	48.22	60.05	72.15	72.46	84.05
13	26	39	52	52.2	65	78	78.2	91
14	28.2	42	56.02	56.03	70	84.02	84.03	98.2
14.2	28.3	42.3	56.07	56.06	70.3	84.06	84.14	98.3
15	30	45.2	60	60.02	75.2	90.02	90.03	

×	2	3	5
16	32.02	48	80
16.02	32.04	48.02	80.02
16.03	32.05	48.03	80.03
16.04	32.06	48.04	80.04
16.05	32.07	48.05	80.05
16.06	32.08	48.06	80.06
16.07	32.09	48.07	80.07
16.08	32.10	48.08	80.08
16.09	32.11	48.09	80.09
16.10	32.12	48.10	80.10
16.11	32.13	48.11	80.11
16.12	32.23	48.12	80.12
16.13	32.24	48.13	80.13
16.14	32.25	48.14	80.14

×	8	8.2	8.3	8.4	8.5
9	72	72.02	72.03	72.09	72.10
9.2	72.1	72.05	72.06	72.07	72.08
10	80.02	80.04	80.05	80.06	80.07
10.2	80.19	80.16	80.15	80.37	80.38
11	88	88.02	88.03	88.04	88.05

×	2	3	4	4.2	5
17	34	51	68	68.2	85
18	36.02	54.02	72.02	72.03	90
18.2	36.04	54.03	72.05	72.06	90.02
18.3	36.05	54.06	72.13	72.11	90.03
18.4	36.09	54.08	72.19	72.17	90.04
18.5	36.09	54.09	72.23	72.21	90.05
19	38	57	76	76.2	95
20	40.02	60	80.03	80.04	100.03
20.2	40.03	60.02	80.04	80.05	100.04
20.3	40.06	60.06	80.16	80.15	100.05
20.4	40.08	60.07	80.18	80.17	100.06
20.5	40.10	60.08	80.23	80.22	100.07

×	2	3	4	4.2
21	42	63.2	84	84.02
21.2	42.4	63.3	84.09	84.08
22	44.2	66	88.02	88.03

×	2	3	4	4.2
22.2	44.3	66.3	88.07	88.06
23	46	69	92	92.2

×	2	3	×	2	×	2
24	48.02	72.04	34	68.3	40.14	80.29
24.02	48.02	77.05	34.2	68.2	41	82
24.03	48.04	72.06	35	70	42	84.02
24.04	48.06	72.07	36	72.02	42.2	84.03
24.05	48.07	72.08	36.02	72.03	42.3	84.06
24.06	48.15	72.11	36.03	72.05	42.4	84.08
24.07	48.16	72.13	36.04	72.06	42.5	84.10
24.08	48.17	72.12	36.05	72.11	42.6	84.12
24.09	48.20	72.14	36.06	72.12	43	86
24.10	48.22	72.15	36.07	72.15	44	88.02
24.11	48.24	72.25	36.08	72.16	44.2	88.03
24.12	48.25	72.26	36.09	72.17	44.3	88.06
24.13	48.26	72.27	36.10	72.18	44.4	88.08
24.14	48.34	72.28	36.11	72.21	45	90
24.15	48.36	72.30	36.12	72.22	45.2	90.02
25	50	75	36.13	72.31	46	92.2
25.2	50.2	75.2	36.14	72.34	46.2	92.3
26.1	52.2	78	37	74	47	94
26.2	52.3	78.3	38	76.2	49	98
27.1	54	81.02	38.2	76.3	49.2	98.2
27.2	54.02	81.04	39	78	50	100.02
27.3	54.03	81.05	39.2	78.4	50.2	100.04
27.4	54.04	81.06	40	80.02	50.3	100.05
27.5	54.05	81.07	40.02	80.04	50.4	100.08
28.8	56.02	84.	40.03	80.05	50.5	100.10
28.2	56.03	84.02	40.-4	80.06		
28.3	56.06	84.06	40.05	80.07		
28.4	56.08	84.07	40.06	80.15		
29	58	87	40.07	80.16		
30	60.02	90.02	40.08	80.17		
30.2	60.03	90.03	40.09	80.20		
30.3	60.06	90.06	40.10	80.22		
30.4	60.09	90.08	40.11	80.24		
31	62	93	40.12	80.27		
33	66	99.2	40.13	80.28		