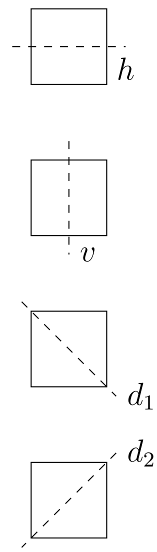
Four Group Tables

D_4: Symmetries of a Square

	r_0	r_1	r_2	r_3	h	v	d_1	d_2
r_0	r_0	r_1	r_2	r_3	h	v	d_1	d_2
r_1	r_1	r_2	r_3	r_0	d_1	d_2	v	h
r_2	r_2	r_3	r_0	r_1	v	h	d_2	d_1
r_3	r_3	r_0	r_1	r_2	d_2	d_1	h	v
h	h	d_2	v	d_1	r_0	r_2	r_3	r_1
v	v	d_1	h	d_2	r_2	r_0	r_1	r_3
d_1	d_1	h	d_2	v	r_1	r_3	r_0	r_2
d_2	d_2	v	d_1	h	r_3	r_1	r_2	r_0



Reflections are over the axes picture above

Rotations are clockwise; r_0 is a rotation by 0°, r_1 by 90°, r_2 by 180°, and r_3 by 270°.

Q_8: The Quaternions

·	1	-1	I	-I	J	-J	K	-K
1	1	-1	I	-I	J	-J	K	-K
-1	-1	1	-I	I	-J	J	-K	K
I	I	-I	-1	1	K	-K	-J	J
-I	-I	I	1	-1	-K	K	J	-J
J	J	-J	-K	K	-1	1	I	-I
-J	-J	J	K	-K	1	-1	-I	I
K	K	-K	J	-J	-I	I	-1	1
-K	-K	K	-J	J	I	-I	1	-1

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

$$I = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$$

$$J = \begin{pmatrix} 0 & i \\ i & 0 \end{pmatrix}$$

$$K = \begin{pmatrix} i & 0 \\ 0 & -i \end{pmatrix}$$

where $i^2 = -1$.

$\mathbb{Z}_8$: Integers Under Addition mod 8

+	0	1	2	3	4	5	6	7
0	0	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7	0
2	2	3	4	5	6	7	0	1
3	3	4	5	6	7	0	1	2
4	4	5	6	7	0	1	2	3
5	5	6	7	0	1	2	3	4
6	6	7	0	1	2	3	4	5
7	7	0	1	2	3	4	5	6

$\mathbb{Z}_4 \times \mathbb{Z}_2$: Direct product of $\mathbb{Z}_4$ and $\mathbb{Z}_2$

+	(0,0)	(1,0)	(2,0)	(3,0)	(0,1)	(1,1)	(2,1)	(3,1)
(0,0)	(0,0)	(1,0)	(2,0)	(3,0)	(0,1)	(1,1)	(2,1)	(3,1)
(1,0)	(1,0)	(2,0)	(3,0)	(0,0)	(1,1)	(2,1)	(3,1)	(0,1)
(2,0)	(2,0)	(3,0)	(0,0)	(1,0)	(2,1)	(3,1)	(0,1)	(1,1)
(3,0)	(3,0)	(0,0)	(1,0)	(2,0)	(3,1)	(0,1)	(1,1)	(2,1)
(0,1)	(0,1)	(1,1)	(2,1)	(3,1)	(0,0)	(1,0)	(2,0)	(3,0)
(1,1)	(1,1)	(2,1)	(3,1)	(0,1)	(1,0)	(2,0)	(3,0)	(0,0)
(2,1)	(2,1)	(3,1)	(0,1)	(1,1)	(2,0)	(3,0)	(0,0)	(1,0)
(3,1)	(3,1)	(0,1)	(1,1)	(2,1)	(3,0)	(0,0)	(1,0)	(2,0)