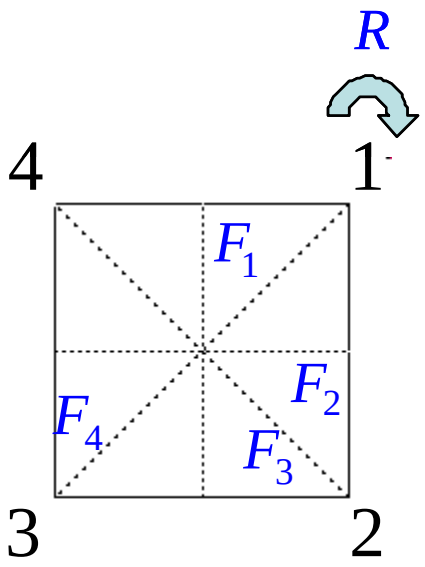
PRACTICE – SOME SPECIAL CASES OF GROUPS

1. Complete the multiplication table below for $\mathbb{Z}_5$.

	0	1	2	3	4
0					
1					
2					
3					
4					

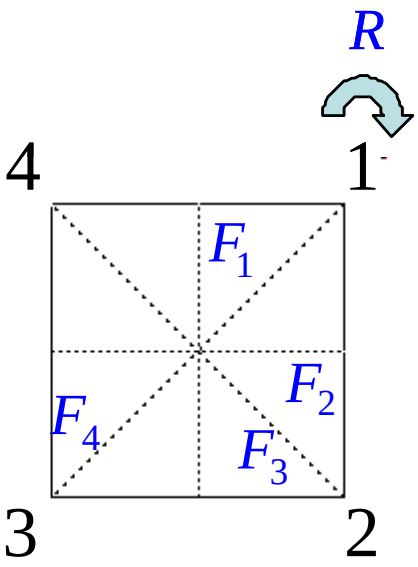
2. With reference to the square diagram below, complete the following multiplication table for D_4.

	$(1)(2)(3)(4)$	$(1\ 2\ 3\ 4)$	$(1\ 3)(2\ 4)$	$(1\ 4\ 3\ 2)$	$(1\ 4)(2\ 3)$	$(1\ 2)(3\ 4)$	$(1\ 3)$	$(2\ 4)$
$(1)(2)(3)(4)$								
$(1\ 2\ 3\ 4)$								
$(1\ 3)(2\ 4)$								
$(1\ 4\ 3\ 2)$								
$(1\ 4)(2\ 3)$								
$(1\ 2)(3\ 4)$								
$(1\ 3)$								
$(2\ 4)$								



3. With respect to the diagram below, complete the following alternate multiplication table for D_4.

	e	R	R^2	R^3	F	FR^2	FR^3	FR
e								
R								
R^2								
R^3								
F								
FR^2								
FR^3								
FR								



Use that,

$$
\begin{aligned}
e &= (1)(2)(3)(4) \\
R &= (1\ 2\ 3\ 4) \\
R^2 &= (1\ 3)(2\ 4) \\
R^3 &= (1\ 4\ 3\ 2) \\
F_1 = F &= (1\ 4)(2\ 3) \\
F_2 = FR^2 &= (1\ 2)(3\ 4) \\
F_3 = FR^3 &= (1\ 3) \\
F_4 = FR &= (2\ 4)
\end{aligned}
$$

$FR = R^3F$ & $RF = FR^3$