Cube root of unity.

$w^3 = 1$.

Set $\{1, w, w^2\}$

×	1	w	w^2
1	1	w	w^2
w	w	w^2	1
w^2	w^2	1	w

$w^4 = w^3 w$

$= 1w = w$

no element is repeated in col or row

1) Closure. Group under '×'

$a \times b = 1$. a is inverse of b.

w & w^2

left the meeting

modulo addition.

mod 5 'mul'

$5/2 = 10$ 2.

$6 > 5$

$6 = 5 \times 1 + 1$ R.

$5 \times 1 + 3$

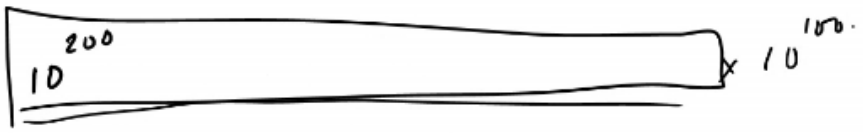
⊕	0	1	2	3	4
0	0	1	2	3	4
1	1	2	3	4	0
2	2	3	4	0	1
3	3	4	0	1	2
4	4	0	1	2	3

$\{0, 1, 2, 3, 4\}$

×	1	2	3	4
1	1	2	3	4
2	2	4	1	3
3	3	1	4	2
4	4	3	2	1

* Polynomials change structure if they are in different bases

* We need to check if they are rings or fields



order of the field.
elements in that field.

$a = p_1^{k_1} p_2^{k_2} p_3^{k_3}$

a^{p-1}, where p is prime

$a^{p-1} \equiv 1 \bmod p$

P	P-1
	1 ... P-1

modulo ~~addition~~ multiplication

11 14

	6	7	8	9
6	1	2	3	4
7	2	4	1	3
8	3	1	4	2
9	4	3	2	1

=

x	1	2	3	4
1	1	2	3	4
2	2	4	1	3
3	3	1	4	2
4	4	3	2	1

$5/2 = 10$ (2) $6 > 5$ R.

$6 = 5 \times 1 + 1$

$5 \times 1 + 3$

We make several copies of that number and preserve the structure

we take n^2 no of structures ?!