

gabo.r.david@gmail.com

- 1.1.
- ① aszoc.  $b \pmod{n}$  inverze  $n-b \pmod{n}$ , neutr.  $0 \pmod{n}$
  - ② aszoc., de nincs mindig inverz pl.  $2 \pmod{6}$ -nak nincs inverze
  - ③ PL mod 7, ekkor  $1, 2, 3, 4, 5, 6$
  - ④ aszoc.?, inverz és neutr. van
  - ⑤  $\{\mathbb{R} \rightarrow \mathbb{R}, x \mapsto ax+b : 0 \neq a \in \mathbb{R}, b \in \mathbb{R}\}$

8 15 22 29 36 43  
50 57 64

$f_1, f_2, f_3$

$$f_1(f_2 f_3) = a_1(a_2 a_3 x + a_2 b_3 + b_2) + b_1 = a_1 a_2 a_3 x + a_1 a_2 b_3 + a_1 b_2 + b_1$$

$$a_2(a_3 x + b_3) + b_2 = a_2 a_3 x + a_2 b_3 + b_2$$

$$(f_1 f_2) f_3 = a_1 a_2 (a_3 x + b_3) + a_1 b_2 + b_1 = a_1 a_2 a_3 x + a_1 a_2 b_3 + a_1 b_2 + b_1$$

- ⑥  $\mathbb{R}^3$ ,  $a \times (b \times c) = (a \times b) \times c$   
nincs egységelem (neutr.)

⑦.

⑧.

1.2  $Q_8 = \{\pm 1, \pm i, \pm j, \pm k\}$

$$\forall q \in Q_8 \quad 1q = q1 = q$$

$$(-1)q = q(-1) = -q$$

$$ij = k, jk = i, ki = j$$

$$ji = -k, kj = -i, ik = -j$$

$$i^2 = j^2 = k^2 = -1$$

$$\tau(1) = 1$$

$$\tau(i) = 4$$

$$\tau(-i) = 4$$

$$\tau(-1) = 2$$

$$\tau(j) = 4$$

$$\tau(-j) = 4$$

$$\tau(k) = 4$$

$$\tau(-k) = 4$$

	1	i	j	k
1	1	i	j	k
i	i	-1	k	-j
j	j	-k	-1	i
k	k	j	-i	-1

$$i^2 = (-1) \quad (-1)^2 = 1$$

$$(i)^4 = \overbrace{(-1) \cdot (-1) \cdot (-1) \cdot (-1)}^i = 1$$

Alga 1 gyakh