Assignment

1. Is 1729 a carmichael Number 2.

→ We know,

1729 is a composite number.

1729 = 7×13 × 19

Henc,

Each P/1729 -> (P-1)

1728:

* 7-9 = 6 and 6/1728

13-1 = 12 and 12/1728

* 19-1 = 18 and 18 (1728

i. Yes 1729 is a charmichael number.

2. Primitive root of 223 2.

The power of 5 modulo 23 generate all nonzero elements of 223 1729 is a composite number.

51 = 5 (mod 23)

52 = 2 (mod 23)

 $5^3 = 3 \pmod{23}$

54 = 4 (mod 23) OSF1/9 2003

59 = 5 (mod 23)

Similarly -- 522 = 1 (modo23) = 1-1 4 13-1-12 and 12/1728

is is the springitive root of modulo 23.

. Yes 1423 is a chammichael mumber.

- 3. Is (711, +...) a rung?
- = 11 is prime number and 211 is field and it satisfies long addistance
 - i) commulative under both addition, multiplication.
 - Associative (2) = (80) -10 : 21517
 - iii) Itas additive and multiplicative i'dendity.
 - so, yes in (211) thom is (tranglition)
- 40 4. Ane (237,+), (235, X) albelian ?
- >> Hene,
 - (Z37,+) -> Yes, it's albelian.
 - (235,x) -> No, all elements invertible.

5. Gef (23) Polynomial 2 S pan 1 (. . + . 11 =) DE . 1 → Let, ns kan malana salang si th 4: Irredeible polynomials f(x) = x3+ x+1 · noitasily it were Field: GF (23) = {0,1, x, x + /, x > x / 1, x / x, ovirtasilgithma bus xxxxxx 20th (in - Philonopin (n+1) (n/+n) = 1 mod (n3+n+1) (M+1) (M+4) = 1 in GF (23). (Esque) -> Yes itie albelian.

(335 x) -> No. all elements invertible.