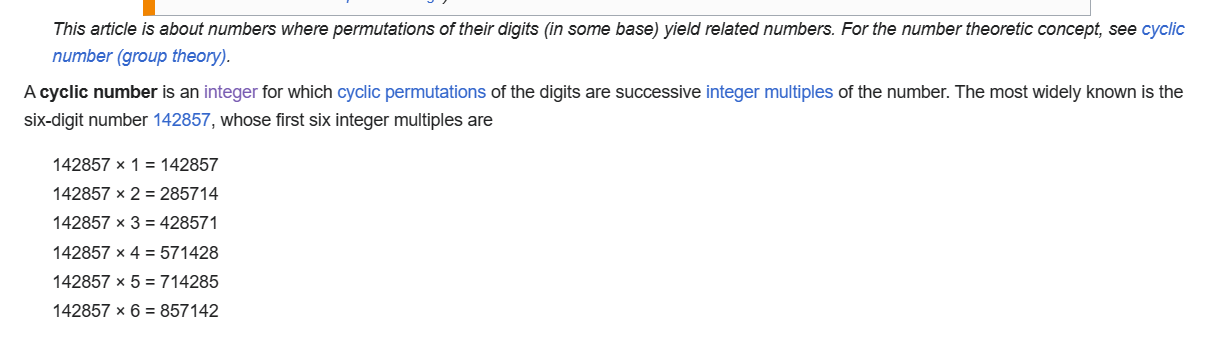
Cyclic number

Def



A cyclic number refers a natural number for which cyclic permutations of the digit are successive integer mutliples of the number.

With mathematically expression, one can express it as follows.

Given where = , is the number of digit of and for all and is a natural number , (i.e. the digit of the number of is unique.

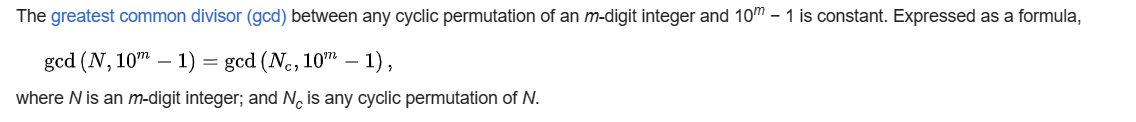
Then, the following holds.

For any in the set (i.e. )

with = , is the number of digit of , one has

1. = , for all (here, = , so the subscription of them do not cause exception )
2. = , for all and .

Property



Proof

First, one has to prove the claim 1.

= for all , when and

Proof of claim 1

Let where (by division theorem) and where

Then

=>

=>

Case 1:

=> , for all

=>

=>

=>

=>

Case 2:

=> , if

=>

Ref

[Cyclic number - Wikipedia](https://en.wikipedia.org/wiki/Cyclic_number)

[Transposable integer - Wikipedia](https://en.wikipedia.org/wiki/Transposable_integer)