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TRANSMUTATION OF A NUMBER INTO SEVEN'S MULTIPLE

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ABSTRACT

The number should be in "abc" form, where a + b + c = 7k "a&k" belongs to "Whole Number", $0 \le b, c \le 9$. Now, we will subtract "a" & "2b" from "abc" and the result should be multiple of seven.

Keywords: *In this method we will use*
1. *Place value of a system.*
2. *We are taking variables:- a, b, c, n, k*

INTRODUCTION

Number theory is a branch of pure mathematics devoted primarily to the study of the integers. It is sometimes called "The Queen of Mathematics".

Given: Here, the sum of a, b & c should be a multiple of seven then only this method is applicable.

$a + b + c = 7k$ --------- (1) [a & k belongs to "**W**",($0 \le b, c \le 9$)]

If $a + b + c \neq 7k$ then we cannot apply this method.

To prove: We have to prove that "n" is a multiple of seven.

Now start converting it subtract "a" & "2b" from "abc" and denote it by "n"

$abc - a - 2b = n$ --------- (2) [a, k & n belongs to "**W**" , ($0 \le b, c \le 9$)]

Proof: We can write "abc" as given below.

$abc = 100a + 10b + c$ ------- (3) (By using place value system)

Substituting equation (3) in equation (2) we get

$100a + 10b + c - a - 2b = n$
$(\underline{98a + 2a}) + (\underline{7b + 3b}) + c - a - 2b = n$
$(98a + 7b) + (2a - a) + (3b - 2b) + c = n$
$(98a + 7b) + (a + b + c) = n$
$(98a + 7b) + 7k = n$ [By using equation (1) a + b + c = 7k]
$7(14a + b + k) = n$

Hence, "n" is a multiple of seven.

Hence proved

Now, we will solve some examples

Example 1:

abc = 3212

Now, $a + b + c = 7k$

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Here, $a = 32, b = 1, c = 2$ [a belongs to "**W**", $(0 \le b, c \le 9)$]

$32 + 1 + 2 = 35 = 7(5)$

Now,

$abc - a - 2b = n$
$3212 - 1(32) - 2(1) = n$
$3212 - 32 - 2 = n$
$3212 - 34 = n$
$3178 = n$
$7(454) = n$

Hence, n is a multiple of seven.

Example 2:

$abc = 142717$

Now,

$a + b + c = 7k$

Here, $a = 1427, b = 1, c = 7$ [a belongs to "**W**", $(0 \le b,c \le 9)$]

$1427+ 1 + 7 = 1435 = 7(205)$

Now,

$abc - a - 2b = n$
$142717 - 1(1427) - 2(1) = n$
$142717 - 1427 - 2 = n$
$142717 - 1429 = n$
$141288 = n$
$7(20184) = n$

Hence, n is a multiple of seven.

CONCLUSION

This can be used in Coding and Decoding.

1) If the code of a locker is <u>139525937</u>. But it's confidential so you can say <u>986547035</u> then nobody can get the code unless he knew this above method.

   Now, by solving <u>986547035</u> we will get our code let's see
   $a = 9865470, b = 3, c = 5$ [a belongs to "**W**", $(0 \le b,c \le 9)$]
   $a + b + c = 7k$
   $9865470 + 3 + 5 = 9865478 = 7(1409354)$
   $986547035 - 1(9865470) - 2(3) = 976681559 = 7(\underline{139525937})$
   The code is <u>139525937</u> now you open your locker.

2) This can be useful thing for our Army or police in hiding file's number, any operation number, they can confuse enemies at which position they are going to attack or protect.

   Example: If army or police want to attack at block no <u>4</u> but enemies can tap our phones then we will say <u>34</u>.

   Now,
   $a = 0, b = 3, c = 4$ [a belongs to "**W**", $(0 \le b, c \le 9)$]
   $a + b + c = 7k$
   $0 + 3+ 4 = 7 = 7(1)$
   $34 - 1(0) - 2(3) = 34 - 6 = 28 = 7(\underline{4})$
   The code is <u>4</u>.

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