🔓 **Research Article**

DISCOVER NEW SECRETS FOR THE NATURAL NUMBERS FROM 0 TO 9

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ABSTRACT

This article presents amazing secrets for the group of numbers from 0 to 9, and what the group of formed numbers holds in which the sum of the two numbers is equal to the original number in terms of: the number of binary numbers formed, the sum of the odd and even numbers for each group of these numbers, the absolute difference between the sum of the odd numbers and the sum of the numbers Even numbers of the resulting numbers in each case.

This article also presents the properties of the numbers 0 through 9, the numbers in the tens place corresponding to each number in terms of the sum of its digits and the absolute difference between each two respective numbers, as well as the prime numbers in each category of the tens place.

KEYWORDS

Discover new secrets, Secrets of natural numbers, natural numbers, numbers from 0 to 9.

Mathematics Subject Classification (2020) – 11A25, 11Y55

INTRODUCTION

The numbers and their symbols are the basis of the beauty of mathematics and the key to the language of communication, through which the human being yearns for the beauty of mathematics and can express quantities and quantities in an easy, simple and understandable language.

The set of numbers from 0 to 9 is the basis for all numbers, large or small, from which everything begins and ends.

And man has been associated with numbers in a close relationship since the time of the early times, when the ancient Babylonians noticed the movements of the planets, recorded them as numbers, and mastered their use to predict eclipses, eclipses and various astronomical phenomena. The ancient Egyptians used numbers to predict the flood of the Nile. The ancient Greeks believed that numbers are the basis of the entire universe, and they used it to express the legends that existed at that time.[1]

Mathematics, including numbers, shapes and structures related to numerology, is a basis for the interpretation of facts, and a framework for understanding the phenomena in the universe, and for this we need to know a lot about these numbers and the secrets they hide, so that we can understand a lot about what is going on around us in an accelerating world full of secret

Preliminary:

Numbers have many uses, they are used for counting, measuring, naming, quantitative expression and the original numbers are the natural numbers 1, 2, 3, 4 and so on. [2] Numbers can be represented in a language that contains numerical words, as it is a universal language with its numbers and symbols that are easy

to communicate with, in addition to its enjoyment of many properties and its possession of many rules reached by mathematicians and mathematical researchers over the past time.

Properties: Numbers from 0 to 9 have many properties, including:

1- Zero is the identity element in addition operation
2- 1 is the identity element in the multiplication operation
3- A number is called even if the number is in the ones digit 0 or even
4- A number is called odd if the number is in the ones digit A number is divisible by 2 if the number is in the ones digit zero or even
5- The number 0 is a multiple of all numbers
6- The number 1 divides all numbers
7- One-digit numbers 2, 3, 5, and 7 are called primes
8- One-digit numbers 0, 1, 4, and 9 are called perfect squares.[3]
9- These numbers also have an important rule in determining the divisibility of numbers.

- A number is divisible by 3 if the sum of its digits is a multiple of 3
- A number is divisible by 4 if the two digits in the ones and tens digit are divisible by 4
- A number is divisible by 5 if the number is in the ones digit 0 or 5 .
- A number is divisible by 6 if the number is divisible by 2 and 3 together
- A number is divisible by 10 if the number is in the ones digit zero.[4]

The result:

1) After studying these numbers and looking into them, the researcher put these numbers in a figure

and formed a set of numbers that consisted of two places and whose sum was the set of numbers for each number as shown in the figure below

```
0  0                                                        0
1  10                                                       1
2  20       11                                              2
3  30       12   21                                         3
4  40       13   31   22                                    4
5  50       23   32   14   41                               5
6  60       15   51   24   42   33                          6
7  70       16   61   25   52   34   43                     7
8  80       17   71   26   62   35   53   44                8
9  90       18   81   27   72   36   63   45   54           9
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Figure1

Figure 1 shows the set of two-digit numbers corresponding to each of the numbers from 1 to 9

2) In the second step, the researcher put these numbers in a table to make it easier to look at these numbers and to note the relationships that connect the resulting set of binary numbers with the original number as it appears in Table 1.

Table (1)

number	Contained numbers										number of numbers	Sum of odd digits	Sum of even digits
0	0										0	0	0
1	10										1	0	1
2	20	11									2	1	3
3	30	12	21								3	3	6
4	40	13	31	22							4	6	10
5	50	14	41	23	32						5	10	15

6	60	15	51	24	42	33					6	15	21
7	70	16	61	25	52	34	43				7	21	28
8	80	17	71	26	62	35	53	44			8	28	36
9	90	18	81	27	72	36	63	45	54		9	36	45

Here we note through Table (1)

We note that the number 0 cannot form any two-digit number, so the number of two-digit digits is 0,

The number 1 form 1 number is 10 and that the number 2 form two numbers are 20 and 11 and the number 3 form 3 numbers are 30, 12, 21 and that the number 4 form 4 numbers are 40, 13, 31, 22 and the number 5 form 5 numbers 50, 14, 41, 23, 32, and that the number 6 form 6 numbers is 60, 15, 51, 24, 42, 33 and that the number 7 form 7 numbers are 70, 16, 61, 25, 52, 34, 43 and that the number 8 form 8 numbers are 80, 17, 71, 26, 62, 35, 53, 44 and the number 9 form 9 numbers are 90, 18, 81, 27, 72, 36, 63, 45, 54,

Here we conclude that the set of numbers consisting of two places is equal to the original number.

This rule applies to numbers as long as zero is entered once in the formation of numbers Hidden Numbers from 0 to 9.

Each of the numbers from 0 to 9 makes up a set of binary numbers with a number equal to the place value of the number.

Proof: The set of two-digit natural numbers resulting from adding two digits to a single-digit number is written as $nn-1, nn-2, nn-3, \ldots, n0$, the number of this set is n

1) Through Table 1 as well as it appears in the two columns, the researcher was able to reach the following two relationships:

a. The sum of the even and odd numbers of the set of numbers consisting of each number is equal to the square of the original number:

(sum of even digits+ sum of odd digits= perfect square original number)

b. The difference between the sum of the odd and even numbers formed for each number is equal to the original number:

(sum of even digits- sum of odd digits= original number)

2) For any natural number from 0 to 9, the following is true:

A group of numbers whose number in ten place of the numbers is equal to the sum of the digits of the number and the difference between every two consecutive numbers is the number 9.

number	Numbers In ones	Numbers In the two digits	# of numbers it has in each place	The difference between every two consecutive numbers	Prime number	
						Table 2
0	0	0	0	nothing	■	
1	1	10	1	One number	■	
2	2	11. 20	2	9	11	
3	3	12,21,30	3	9	■	
4	4	13,22,31,40	4	9	13,31	
5	5	14,23,32,41,50	5	9	41	
6	6	15,24,33,42,51,60	6	9	■	
7	7	16,25,34,43,52,61,70	7	9	43,61	
8	8	17,26,35,44,53,62,71,80	8	9	17,71,53	
9	9	18,27,36,45,54,63,72,81,90	9	9	■	
Sum=45		# number=45			# number 9	

Through Table 2, we note

1) The sum of the numbers in the two digits is equal to the sum of the numbers from 0 to 9

So, we notice that the sum of the numbers from 0 to 9 is equal to 45, which is the same as the number of numbers in the two digits.

2) The difference between every two consecutive numbers = 9.

3) In Table 2, 45 numbers appear in addition to the group of numbers from 0 to 9, and 45 numbers remain that did not appear in the two digits which are the ones that appear in Table 3 below

Table 3

digit	The numbers that do not appear in Table 2	Prime number
From 10 to 19	19	19
From 20 to 29	28 , 29	29
From 30 to 39	37, 38,39	37

From 40 to 49	46, 47, 48, 49	47
From 50 to 59	55,56,57,58,59	59
From 60 to 69	64,65,66,67,68,69	67
From 70 to 79	73,,74,75,76,77,78,79	79
From 80 to 89	82,83,84,85,86,87,88,89	89
From 90 to 99	91,92,93,94,95,96,97,98,99	97
The number of numbers	45	9

1) When comparing tables 1 and 2, it appears that the number of prime numbers in each table separately is 9 and it is equal

RECOMMENDATIONS

The researcher recommends further study and research in numbers from 0 to 9 to discover more secrets of these numbers and to provide researchers, scholars and those interested in computer programming to benefit from them and benefit the humanity from these numbers and the rules and characteristics they contain.

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