FINDINGS ON TESLA'S NUMBERS 3,6,9

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Abstract

In this paper I would bring to light a few discoveries of mine on Tesla's numbers .

1 Introduction

As the inventor and innovator Nikola Tesla famously said "If you only knew the magnificience of 3,6 and 9, then you would have the key to the universe",these three numbers appear to occur mysteriously within our universe without man most of the time realizing it. It is indeed no wonder, the subject of Tesla's 'superstition'.

In my own view, all natural numbers seem to revolve around these three numbers 3,6 and 9 in some sort of vortex.That probably accounts for why vortex mathematics is dedicated to studying numbers of this nature.

In this paper, I would cast some light on these very special behaviours of these numbers in relation to how they affect time, vibration and their role in diophantine equations, special functions,sum of natural and whole numbers, numerical sequences and the Fibonacci sequence so that we can appreciate the genius of Tesla much more and to appreciate the omnipresence of these three numbers .

As would appear in this paper, let δ(n) denote the digital root of a number,n and μ(n) denote the multiplicative root of a number,n.

2 Examining Tesla's numbers in terms of

2.1 Frequency

Quoting Nikola Tesla, "If you want to find the key to the universe, think in terms of energy,frequency and vibration." Starting off with frequency, the frequency 432 Hz is said to be mathematically consistent with universal patterns as it unifies properties of gravity, light, magnetism, matter, space and time[1].

This frequency is known for its meditative and relaxing effects as well when it is used in binaural beats. However, it is observed that the digital root of 432 is 9 that is, $(4 + 3 + 2 = 9)$ and if this frequency is superimposed with 234Hz (its numerical reverse) , we would be getting a frequency of 666Hz that is to say, 432Hz+234Hz=666Hz. Also, the digital root of 666 is 9. If the frequency is flipped over, we get 999Hz whose digital root is 9 as well.

2.2 Time

Tesla's numbers 3,6 and 9 have found and wound its way into the affairs into time. Time, described as the fourth dimension has some sort of chemistry with these numbers. With regards to seconds, there are 60 seconds in a minute thus $\delta(60) = 6$ likewise the number of minutes in an hour.

Also, there are 1440 minutes in a day and 86400 seconds in a day thus $\delta(1440) = 9$ and $\delta(86400) = 9$. There are as well 604800 seconds, 10080 minutes and 168 hours in a week thus $\delta(604800) = 9$ $\delta(10080) = 9$ and $\delta(168) = 6$. Moreover there are 12 months in a calendar year and 31536000 seconds in a year however $\delta(12) = 3$ and $\delta(31536000) = 9$.

2.3 Vibration

Oscillation is synonymous to vibration. The period of oscillation can be simply described as the time (number of seconds) within which an oscillation is done.From high school physics, we know that the period of oscillation, T is the time(in seconds) within which an oscillation is done. The period of oscillation is expressed mathematically as :

$$T = 2\pi\sqrt{\frac{l}{g}}$$

where π has got the number 3 leading the never ending decimals behind it and g being the acceleration due to gravity with a value of $9.80665m/s^2$ and obviously has the number 9 bearing the weight of the other decimals.

However, it should be noteworthy that 2π is equivalent to τ and τ equals 6.283185... and very evidently has 6 leading the rest of the digits. The numbers 3,6 and 9 has clearly got its way through this equation.

3 Delving into the mathematics

3.1 Diophantine equations

Proposition 1:

Suppose Tesla's numbers 3,6 and 9 were expressed as exponentials :
$3^x + 6^y + 9^z = m$
where x,y,z,m belong to a set of positive integers, δ(m) = 3,6 and 9.
Example 1
$3^{10} + 6^{13} + 9^7 = 13065536034$

$\delta(13065536034) = 1+3+0+6+5+5+3+6+0+3+4 = 9$

Example 2

$3^{19} + 6^{23} + 9^{15} = 789936115347958932$

$\delta(789936115347958932) = 7+8+9+9+3+6+1+1+5+3+4+7+9+5+8+9+3+2 = 9$

Proposition 2

Consider that Tesla's numbers 3,6 and 9 are expressed as a linear diophantine equation : $3x + 6y + 9z = q$ where x,y,z,q belong to a set of positive integers, δ(q) would yield 3,6 or 9.

Example 1

$3(101) + 6(12) + 9(11) = 474$

$\delta(474) = 4+7+4 = 6$

Example 2

$3(200) + 6(112) + 9(191) = 2991$

$\delta(2991) = 2+9+9+1 = 3$

Example 3

$3(314) + 6(278) + 9(1202) = 13428$

$\delta(13428) = 1+3+4+2+8 = 9$

It is quite interesting to know that numbers conforming to the condition in Proposition 2 are numbers which are all divisible by 3,6 and 9(provided the unknowns are odd numbers) which is not usually the case of some other three-variable diophantine equations. For instance:

$3(141) + 6(273) + 9(541) = 6930$

6930 divided into 3 yields 2310,6930 divided into 6 yields 1155 and 6930 divided into 9 yields 770.

Unlike any other diophantine equation like say:

$2x + 3y + 5z = n$ (where for instance, x=19 y=23 z= 29)

In this case n would be 252 which is divisible by 2 and 3 except for 5.

3.2 Special functions

Proposition 1

δ(n!) = 9 where n is greater than or equal to 6.

Example 1

$17! = 355687428096000$

$\delta(35568742809600) = 9$

Example 2

$21! = 51090942171709440000$

$\delta(51090942171709440000) = 9$

However,provided n is greater than or equal to 0 and less than or equal to 2, $\delta(n!)$ would yield 1 and 2.

Examples

0!= 1 thus $\delta(0!)$ = 1

1!= 1 therefore $\delta(1!)$= 1

2!= 2 thus $\delta(2!)$= 2

The appearance of 3 and 6 as digital roots as far as factorials are concerned is rather negligible. It is only when n equals 3,4 and 5 that 3 and 6 become digital roots.

For instance,

3!=6

4!=24 but $\delta(24) = 6$

5!= 120 but δ(120)=3

The extensive nature of the factorial notation into the Gamma function tells how versatile the concept of digital roots(much especially 3,6 and 9) irrespective of how trivial-looking the concept of digital roots may be.

Proposition 2

It is well established that $\Gamma(z) = (z-1)!$, but however $\delta(\Gamma(\text{z}))$ yields 3,6 or 9 provided z is greater than or equal to 4 and remains 9 as long as z is greater than or equal to 7.

This is virtually nothing very different from Proposition 1. Very similar conditions apply with reference to the exceptions made in Proposition 1.The only condition here is to set $z = n + 1$ and be substituted where n occurs in Proposition 1.

For instance

Provided z is greater than or equal to 1 and less than or equal to 3, $\delta(z!)$ would yield 1 and 2.

Example 2

Provided z equals 4,5 or 6 as far as factorials are concerned, 3,6 would emerge as digital roots.

3.3 Product of numbers

It is observed that 3,6 and 9 have an "infectious" effect on other numbers such that when 3,6 or 9 is multiplied by any number, the digital root of the resulting number becomes 3,6 or 9. For example,

$3 \cdot 100 = 300$ and $\delta(300) = 3$

$6 \cdot 13 = 78$ and $\delta(78) = 6$

$9 \cdot 1957 = 17613$ and $\delta(300) = 9$

In addition, it is observed that if all natural numbers counting all the way up to infinity were multiplied by 3 and 6 as well, we see the digital roots of the resulting numbers exhibiting a colorful display of 3,6 and 9 alternating beautifully. Let's consider the table below.

Let δ denote the digital root of the resulting values.

From the table above, we observe how the 3 and 6 multiplication table yield 3,6 and 9 and 6,3 and 9 respectively as far as digital roots are concerned but however, suppose the multiplication sign throughout the multiplication procedure was replaced by the addition sign (+), we observe that we get positive integers starting from 4 and 7 in the case of the 3 and 6 timetable respectively. That is to say, $3 + 1 = 4$, $3 + 2 = 5$, $3 + 3 = 6$, $3 + 4 = 7$, $3 + 5 = 8$(for the 3 timetable),...and for the "6x" column, we see $6 + 1 = 7$, $6 + 2 = 8$, $6 + 3 = 9$, $6 + 4 = 10$, $6 + 5 = 11$,...

3x	δ**(3x)**	**6x**	δ**(6x)**
$3 \cdot 1 = 3$	3	$6 \cdot 1 = 6$	6
$3 \cdot 2 = 6$	6	$6 \cdot 2 = 12$	3
$3 \cdot 3 = 9$	9	$6 \cdot 3 = 18$	9
$3 \cdot 4 = 12$	3	$6 \cdot 4 = 24$	6
$3 \cdot 5 = 15$	6	$6 \cdot 5 = 30$	3
$3 \cdot 6 = 18$	9	$6 \cdot 6 = 36$	9
$3 \cdot 7 = 21$	3	$6 \cdot 7 = 42$	6
$3 \cdot 8 = 24$	6	$6 \cdot 8 = 48$	3
$3 \cdot 9 = 27$	9	$6 \cdot 9 = 54$	9
: :	:	: :	:

Table 1: Observing the 3 and 6 timetable

Moreover replacing the addition sign in discussion now with a minus sign literally yields a number line starting from 2,1 and moving straight into the negative realm that is to say, $3 - 1 = 2$, $3 - 2 = 1$, $3 - 3 = 0$, $3 - 4 = -1$, $3 - 5 = -2$, $3 - 6 = -3$,...(considering the "3x" table) and $6 - 1 = 5$, $6 - 2 = 4$, $6 - 3 = 3$, $6 - 4 = 2$, $6 - 5 = 1$, $6 - 6 = 0$, $6 - 7 = -1$, $6 - 8 = -2$, $6 - 9 = 3$, $6 - 10 = -4$, $6 - 11 = -5$, $6 - 12 = -6$,... (with reference to the "6x" table)

This all goes to prove how every number is connected to 3,6 and 9.

Despite the fact that 3,6 and 9 are in discussion in this paper, 9 was not included in the table above because it would be a raw and monotonous repetition of 9 throughout. The number 9 is the largest of the three numbers 3,6 and 9 and signifies completion in numerology. However, the number 9 has proven such consistency in mathematics as has appeared in the propositions I made above and much more to be realised.

The numbers 3,6 and 9 connect in a quite unique manner.

Example 1

The first digital root of the number 369 is divisible by 3,6 and 9.

$3 + 6 + 9 = 18$

18 is divisible by 3,6 and 9.

Example 2

The sum of all three-digit permutable forms of the numbers 3,6 and 9 is divisible by 3,6 and 9. That is to say,

$369 + 963 + 396 + 639 + 936 + 693 = 3996$

and 3996 is divisible by 3,6 and 9.

3.4 Sums

Let

$$\Sigma(n) = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + ... + n \qquad (1)$$

where Σ(n) is the sum of natural numbers from 1 to n.

Again, let S(n) be the sum from 1 to n for which the digital root of S(n) would be 3,6 or 9.

Thus,

S(2) $= 1 + 2 = 3$
S(3) = S(2) + $\underline{3} = 6$
S(5) = S(3) + $\underline{4 + 5} = 15 = 6$
S(6) = S(5) +$\underline{6} = 21 = 3$
S(8) = S(6) +$\underline{7 + 8} = 36 = 9$
S(9) = S(8) + 9 = 45 = 9
S(11) = S(9) + $10 + 11 = 66 = 3$
S(12) = S(11) + 12 = 78 = 6
S(14) = S(12) + $13 + 14 = 105 = 6$
S(15) = S(14) + 15 = 120 = 3
S(17) = S(15) + $16 + 17 = 153 = 9$
S(18) = S(17) + 18 = 171 = 9

From the above couple of equations, there are a couple of fascinating things to observe. First, looking at the left side of the equations stated above,from ; S(2), S(3), S(5), S(6), S(8), S(9), S(11), S(12),S(14),S(15),S(17),S(18)..., we realise that S(3),S(6) and S(9) did not disappoint in demystifying the 3,6,9 pattern hidden in our numbers.

Suppose we list the numbers n within S(n) from S(2) to S(18) that is to say,
$2, 3, 5, 6, 8, 9, 11, 12, 14, 15, 17, 18...$

It is observed that the above sequence have alternating common differences that is to say, a 1-2-1-2-1-... pattern running through. This is where prime numbers come into play because some of the numbers in the sequence above conform to the formula $\frac{p_0-1}{2}$ where p_0 denotes odd primes greater than or equal to 5 [2].

Examples

$\frac{5-1}{2} = 2$
$\frac{7-1}{2} = 3$
$\frac{11-1}{2} = 5$
$\frac{13-1}{2} = 6$
$\frac{17-1}{2} = 8$
$\frac{19-1}{2} = 9$

The number 17 from the sequence above is an exception and there are more such exceptions likely to be found. This would be elaborated in the short calculation below.

Let $\frac{p_0-1}{2} = 17$
$p_0 - 1 = 17(2)$
$p_0 = 34 + 1$
$p_0 = 35$ (And 35 is not a prime number)

However, the sequence of numbers above ie. (2,3,5,6,8,9,...) can be identified as numbers congruent to 0 or 2mod3.[3]

The 1-2-1-2-1-2-1-2-1 pattern is one which is special in its own way. Considering the equations above particularly on the right side, we realise that the number of numbers beside S(2) downwards alternate in a 1-2-1-2-1-...pattern (from the underlined numbers downwards).

The 1-2-1-2-1-2-1-...pattern connects to 3,6 and 9 in an impressive manner as would be illustrated below:

Let

$$S(q) = 1 + 2 + 1 + 2 + 1 + 2 + 1 + 2 + 1 + 2 + 1 + 2 + 1 + ... + q \qquad (2)$$

Thus,

S(1) = 1 = 1
S(2) = S(1) + 2 = 3
S(3) = S(2) + 1 = 4
S(4) = S(3) + 2= 6
S(5) = S(4) + 1=7
S(6) = S(5) + 2=9
S(7) = S(6) + 1=10
(And it continues...)

From the above couple of sums, it is observed that provided the array of numbers in S(q) were summed for an even numbers of times, S(q) would yield values with 3,6 or 9 as digital roots.

Moreover, provided we were to count whole numbers that is to say,

Σ(m)= $0 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + ... + m$

where S(m) is the sum of whole numbers at which δ(S(m)) yields 3,6 or 9, we realise that the pattern of numbers yielded by S(m) is no different from the string of final values in the series of equations starting from S(2) in (1) of page 6 above (without considering them by their digital roots). For instance,

S(3) = $0 + 1 + 2$ = 3
S(4) = S(3)+3= 6
S(6) = S(4)+$4 + 5$= 15 = 6
S(7) = S(6)+6= 21 = 3
S(9) = S(7)+$7 + 8$ = 36 = 9
S(10) = S(9)+9 = 45 = 9
(And it continues...)

From (1), let $N(n)$ be the sum of natural numbers for which the digital root of $N(n)$ is not 3,6 or 9.

$N(1)$ = 1
$N(4)$ =$N(1)$+$2 + \underline{3} + 4$= 10
$N(7)$ = $N(4)$+$5 + \underline{6} + 7$= 28
$N(10)$= $N(7)$+$8 + \underline{9} + 10$= 55
$N(13)$= $N(10)$+$11 + \underline{12} + 13$=91
$N(16)$= $N(13)$+$14 + \underline{15} + 16$=136
$N(19)$= $N(16)$+$17 + \underline{18} + 19$=190
(And the system goes on and on...).

From the couple of equations just above, the underlined numbers depict the occurrence of the numbers 3,6 or 9 or numbers whose digital roots yield 3,6 or

9. Moreover the common differences of the consecutively resulting numbers are multiples of 9 and hence have a digital root of 9. For instance,

$N(4)$ - $N(1)$ = 9
$N(7)$ - $N(4)$ = 18
$N(10)$ - $N(7)$= 27
(And on and on...)

3.5 Fibonacci sequence

Taking the Fibonacci sequence, 0,1,1,2,3,5,8,13,21,34,55...., suppose we started off without 0, that is to say,

1,1,2,3,5,8,13,21,34,55,89,144,...and we multiplied them by each other,the numbers 3,6 and 9 would be the only ones to make appearances.

For instance,provided M(n) denotes the product of numbers from 1 to the nth number for which the digital root of M(n) is 3,6 or 9.

$M(4) = 1 \cdot 1 \cdot 2 \cdot 3 = 6$
$M(5) = M(4) \cdot 5 = 30$= 3
$M(6) = M(5) \cdot 8 = 240 = 6$
$M(7) = M(6) \cdot 13 = 3120 = 6$
$M(8) = M(7) \cdot 21 = 65520 = 9$
$M(9) = M(8) \cdot 34 = 2227680 = 9$
$M(10)$= $M(9) \cdot 55 = 122522400$= 9
(And it continues on and on with 9 as the digital root of the resulting answers)

3.6 Prime numbers

The prime number 3 is the only single digit number with a digital root of 3 and aside that no other prime number with more than one digit exhibits that. This leads to the conclusion that aside 3, no other prime number has 3,6 and 9 as a digital root unless otherwise proven wrong.

3.7 Exponentials,Numerical occurrences,divisibility and sequences

Among these three very special numbers 3,6, and 9, I would like to cast some light on the number 9. The number 9 in my own words is in itself an embodiment of the three numbers in discussion in a sense that, 9 is a square of 3, thus 3 as the base number is a number on its own. If 3 is multiplied by its power 2, we get 6 (though the norms of mathematics is breached in this case).

It is an established fact that the product of 3,6 or 9 with any number would yield a value with a digital root of 3,6 or 9 as has been put forth in subsection 4.3 but however the three numbers in discussion pop up in ways unimaginable as far as numbers is concerned.For instance, in cases where 3,6 and 9 are expressed as exponents and as subscripts.

As far as exponents are concerned, the exponents of 3,6 and 9 as a number would have a digital root of 9 provided it is greater than 1.

Examples

value of x	3^x	6^x	9^x
x=1	3	6	9
x=2	9	36=9	81=9
x=3	27=9	216=9	729=9
x=4	81=9	1296=9	6561=9
x=5	243=9	7776=9	59049=9
x=6	727=9	46656=9	531441=9
x=7	2187=9	279936=9	4782969=9
x=8	6561=9	1679616=9	43046721=9
x=9	19683=9	10077696=9	387420489=9

Table 2: Exponents of 3,6 and 9 with digital roots

Subscripts in mathematics are used to denote the number of times a number is repeated or simply numerical occurrence.For instance,9_5 implies 99999 and 7_7 also denotes 7777777.

It is observed that if any one of the numerical digits from 1 to 9 which is taken and repeated thrice turns out to be divisible by 3.

Examples

$\frac{111}{3} = 37$
$\frac{222}{3} = 74$
$\frac{333}{3} = 111$
$\frac{444}{3} = 148$
$\frac{555}{3} = 185$
$\frac{666}{3} = 222$
$\frac{777}{3} = 259$
$\frac{888}{3} = 296$
$\frac{999}{3} = 333$

However this condition does not apply to the number 6. It is very selective in this case as this condition tends to favour even numbers between 1 to 9 as would be seen below.

$\frac{222222}{6} = 37037$
$\frac{444444}{6} = 74074$
$\frac{666666}{6} = 111111$
$\frac{888888}{6} = 148148$

Also,provided any digit from 1 to 9 is taken and repeated 9 times is divisible by 9. It is however worth taking note of the resulting answers but not particularly the 3rd and 6th outcomes since they do not contain a lot of varieties as far digits are concerned.

Examples

$\frac{111111111}{9} = \underline{1}234567\underline{9}$
$\frac{222222222}{9} = \underline{2}469135\underline{8}$

$\frac{333333333}{9} = \underline{3}703703\underline{7}$
$\frac{444444444}{9} = \underline{4}938271\underline{6}$
$\frac{555555555}{9} = \underline{6}172839\underline{5}$
$\frac{666666666}{9} = \underline{7}407407\underline{4}$
$\frac{777777777}{9} = \underline{8}641975\underline{3}$
$\frac{888888888}{9} = \underline{9}876543\underline{2}$
$\frac{999999999}{9} = \underline{1}1111111\underline{1}$

It can be seen that the first underlined digit downwards reveal natural numbers counting from 1 to 9 without 5 making an appearance. Also, the last digit of the first resulting value downwards displays a countdown of natural numbers from 9 to 1. The first value appears to be an occurrence of digits from 1 to 9 without the number making an appearance and the 8th value moreover appears to be a countdown from 9 to 2.

If every resulting value were to be scrutinized for numbers that are missing out (without considering the 3rd,6th and 9th outcomes), the numbers, 8,7,5,4,2,1 respectively would emerge. These six numbers exhibit the 1-2-1-2-1 pattern among themselves which has been highlighted upon in subsection 4.4.

Suppose we consider the natural numbers from 1 to 9 as a number on its own that is to say, 123456789, it turns out that it is divisible by 3,6 and 9.

With regards to sequences, let us consider a string of perfect cubes.

$1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, ...$

If we took the above series of cubes by their digital roots, we would notice a 1-8-9-1-8-9-1-8-9 pattern and very obviously, it appears that the first two digits sum up to yield the third number that is to say, $1 + 8 = 9$.

Also, considering the 1-8-9-1-8-9-1-8-9 pattern, the sum of these numbers for which the digital root of the resulting number is 3,6 or 9 obeys the conditions of S(n) as discussed in the subsection 3.4. That is to say,

S(2) = $1 + 8 = 9$
S(3) = S(2)+9=18=9
S(5) = S(3)+1+8=27=9
S(6) = S(5)+9=36=9
S(8) = S(6)+1+8=45=9
S(9) = S(8)+9=54=9

These are a handful of findings as far as the ubiquity of the numbers 3,6 and 9 are concerned.

References

[1]https://meditativemind.org/tesla-said-it-einstein-agreed-science-proved-it/

[2] @miscoeis, author=Sloane, Neil J. A. and The OEIS Foundation Inc., title=The on-line encyclopedia of integer sequences, year=2010, url=http://oeis.org/A005097

[3] @miscoeis, author=Sloane, Neil J. A. and The OEIS Foundation Inc., title=The on-line encyclopedia of integer sequences, url= http://oeis.org/A007494

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