UNIVERSAL CONSTANT OF DIVISION OF ORDER 1

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This paper is dedicated to my grandmother Tanima Mukherjee (Dida)

ABSTRACT. The present paper is a mathematical investigation into the division of unique numbers composed of digits in succession. The paper focuses on the division of a number (whose digits are written in the descending order in succession, starting with a two digit number) like 151413121110987654321, by its reverse counterpart number(whose digits are written in the ascending order in succession, ending with the same number that started the descent) which is 123456789101112131415. The author found out the values of the quotients of such divisions up till the division of the number 999897...321 by the number 123...979899, and observed a unique feature common to each division. It was realized that the quotients of two successive divisions of this nature have a constant difference between them, equal to the irrational number 0.0818181... which has been termed as the Universal Constant of Division (UCD) of the first Order. Similar analysis and extrapolation to even higher divisions (involving three digit numbers) reveals a startling yet similar feature about them. The quotients of such huge divisions are tedious to calculate and require computation instead of manual calculation in order to be evaluated. Using the value of UCD of the first order, the author was able to express the complex division quotients in terms of an Arithmetic Progression and thus make the calculations manual and simpler. The author finishes the paper with an introspection into the nature of the Universal Constant of Division and it's analogy with the Ramanujan formula for Pi. The paper is a study out of sheer observation and tries to dwell deep into the realms of the fascinating operation of division and succession.

1. INTRODUCTION

Numbers composed of digits in succession reveal a unique property in their divisions with their reverse counterparts. Consider a number that has two-digit numbers in a decreasing succession as follows:

Definition 1.1. Let the number be equal to 16151413121110987654321. This is a number composed of digits written in succession in a decreasing order from 16 to 1. Such a number shall henceforth be known as a **Descendor** of the first order and will be treated as the numerator in all further discussions in the paper.

Definition 1.2. The reverse counterpart of the above number will be composed of digits in the ascending order in succession, which is 12345678910111213141516. The digits start from 1 and successively progress till 16. Such a number shall henceforth be known as the **Ascendor** of the first order and will be treated as the denominator in all further discussions in the paper.

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Definition 1.3. The **Universal Division (UD)** is defined as the division of the Descendor of the first order by the Ascendor of the first order. The smallest Universal Division of the first order is between 10987654321 and 12345678910, while the largest and last division of the first order is between 999897..321 by 123...979899. The mathematical representations are as follows:

$$UD_{0,1} = \frac{10987654321}{12345678910}$$

$$UD_{2,1} = \frac{121110987654321}{123456789101112}$$

$$UD_{2,2} = \frac{103102101100.....121110987654321}{123456789101112.....100101102103}$$

Definition 1.4. The **Significance** is defined as the digit in the units place of the largest two digit number in the Universal Division. In the first example shown above, the largest two digit number is 10. Thus the significance of this Universal division is equal to 0. Similarly, the Significance for the second and third examples shown above are 2 and 3 respectively. The first sub-script of the Universal Division represents Significance while the second sub-script represents the order of the division. First order divisions involve two-digit numbers, Second order divisions involve three-digit numbers and so on. A Universal Division having a Significance of m and an Order of n will be represented as $UD_{m,n}$

2. UNIVERSAL CONSTANT OF DIVISION(UCD)- FIRST ORDER

Consider the values of two successive Universal Divisions having their Significance equal to 5 and 6, as follows:

$$UD_{5,1} = \frac{151413121110987654321}{123456789101112131415} = 1.226446291$$

$$UD_{6,1} = \frac{16151413121110987654321}{12345678910111213141516} = 1.308264474$$

The difference between these two values is given as:

$$UD_{6,1} - UD_{5,1} = 1.308264474 - 1.226446291$$
$$UD_{6,1} - UD_{5,1} = 0.081818183$$
$$UCD_1 \simeq 0.0\overline{81}$$
$$UCD_1 = \frac{9}{110}$$

Where UCD stands for Universal Constant of Division and the sub-script represents that it is for the Universal Division of the first order.

Theorem 2.1 (Universal Theorem of Division)**.** *The difference between the quotients of any two successive Universal divisions is a constant value called the Universal Constant of Division (UCD).*

$$UD_{n+1,j} - UD_{n,j} = UCD_j$$

The **Corollary** of the above theorem is that the Universal Divisions yield quotients in an arithmetic progression with the common difference equal to the UCD.

$$UD_{n,j} = UD_0 + (n-1)\,UCD_j$$

Theorem 2.2. *The Universal Constant of Division of the first order is equal to an irrational number having a value of* 0.0818181....

$$UCD_1 = \frac{9}{110} = 0.0\overline{81}$$

Proof. Let the Descendor of the first order be represented by N as it is the numerator of the Universal Division. An example of N is as follows:

$$N = 121110987654321$$

2.1. **DESCENDOR** N**:** The general form of the Descendor N can be written as:

$$N = 987654321 + \left[10\times10^9 + 11\times10^{11} + 12\times10^{13} + ... + (10+n)\times10^{2n+9}\right]$$

$$N = 987654321 + \sum_{m=0}^{n}(10+m)\times10^{2m+9}$$

$$N = 987654321 + 10^9\sum_{m=0}^{n}(10+m)\times10^{2m}$$

$$N = 987654321 + \left(10^9\times S_1\right)$$

Where

$$S_1 = \sum_{m=0}^{n}(10+m)\times10^{2m}$$

(2.1) $$S_1 = (10+0)\times10^0 + (10+1)\times10^2 + ... + (10+n)\times10^{2n}$$

Multiplying equation (2.1) by 100, we get:

(2.2) $$100S_1 = (10+0)\times10^2 + (10+1)\times10^4 + ... + (10+n)\times10^{2n+2}$$

Subtracting the equations (2.1) and (2.2), we get:

$$S_1 - 100S_1 = (10+0)\times10^0 + ... + [(10+n)-(10+n-1)]\times10^{2n} - (10+n)\times10^{2n+2}$$

$$-99S_1 = 10 + \left[(1) \times 10^2 + (1) \times 10^4 + ... + (1) \times 10^{2n}\right] - (10+n) \times 10^{2n+2}$$
$$-99S_1 = 10 + \left[10^2 + 10^4 + ... + 10^{2n}\right] - (10+n) \times 10^{2n+2}$$
$$-99S_1 = 10 + \frac{100}{99}\left(10^{2n} - 1\right) - (10+n) \times 10^{2n+2}$$
$$99S_1 = (10+n) \times 10^{2n+2} - \frac{100}{99}\left(10^{2n} - 1\right) - 10$$
$$99S_1 = \frac{1}{99}\left[99 \times (10+n) \times 10^{2n+2} - 100 \times \left(10^{2n} - 1\right) - 990\right]$$
$$99S_1 = \frac{1}{99}\left[(990+99n) \times 10^{2n+2} - 10^{2n+2} + 100 - 990\right]$$
$$S_1 = \frac{1}{9801}\left[(989+99n) \times 10^{2n+2} - 890\right]$$

Thus the Descendor N is given as:

$$N = 987654321 + \frac{10^9}{9801}\left[(989+99n) \times 10^{2n+2} - 890\right] \tag{2.3}$$

2.2. **ASCENDOR D:.** An example of the Ascendor D is:

$$D = 123456789101112$$

The genreal form of the Ascendor D is:

$$D = 123456789 \times 10^{2n+2} + \left[10 \times 10^{2n} + 11 \times 10^{2n-2} + ... + (10+n-1) \times 10^2 + (10+n) \times 10^0\right]$$
$$D = 123456789 \times 10^{2n+2} + \sum_{m=0}^{n} (10+m) \times 10^{2n-2m}$$
$$D = 123456789 \times 10^{2n+2} + S_2$$

Where

$$S_2 = \sum_{m=0}^{n} (10+m) \times 10^{2n-2m}$$
$$S_2 = 10 \times 10^{2n} + 11 \times 10^{2n-2} + ... + (10+n-1) \times 10^2 + (10+n) \times 10^0 \tag{2.4}$$

Multiplying equation (2.4) by 100, we get:

$$100S_2 = 10 \times 10^{2n+2} + 11 \times 10^{2n} + ... + (10+n-1) \times 10^4 + (10+n) \times 10^2 \tag{2.5}$$

Subtracting equations (2.5) and (2.4), we get:

$$100S_2 - S_2 = 10 \times 10^{2n+2} + (11-10) \times 10^{2n} + ... + [(10+n) - (10+n-1)] \times 10^2 - (10+n)$$
$$99S_2 = 10 \times 10^{2n+2} + \left[10^{2n} + 10^{2n-2} + ... + 10^2\right] - (10+n)$$
$$99S_2 = 10 \times 10^{2n+2} + \left[10^2 + 10^4 + ... + 10^{2n}\right] - (10+n)$$

$$99S_2 = 10 \times 10^{2n+2} + \frac{100}{99}\left(10^{2n} - 1\right) - (10 + n)$$

$$99S_2 = \frac{1}{99}\left[990 \times 10^{2n+2} + 100 \times \left(10^{2n} - 1\right) - 99 \times (10 + n)\right]$$

$$99S_2 = \frac{1}{99}\left[990 \times 10^{2n+2} + 10^{2n+2} - 100 - 990 - 99n\right]$$

$$S_2 = \frac{1}{9801}\left[991 \times 10^{2n+2} - 99n - 1090\right]$$

Thus the Ascendor D is given as:

$$D = 123456789 \times 10^{2n+2} + S_2$$

$$D = 123456789 \times 10^{2n+2} + \frac{1}{9801}\left[991 \times 10^{2n+2} - 99n - 1090\right] \tag{2.6}$$

2.3. **UNIVERSAL DIVISION UD$_n$**. The Universal Division of the first order is given as the division of the Descendor of the first order by the Ascendor of the first order. Thus it is mathematically expressed as:

$$UD_n = \frac{N}{D}$$

Substituting the values from equations (2.3) and (2.6), we get:

$$UD_n = \frac{987654321 + \frac{10^9}{9801}\left[(989 + 99n) \times 10^{2n+2} - 890\right]}{123456789 \times 10^{2n+2} + \frac{1}{9801}\left[991 \times 10^{2n+2} - 99n - 1090\right]}$$

$$UD_n = \frac{987654321 \times 9801 + 10^9 \times \left[(989 + 99n) \times 10^{2n+2} - 890\right]}{123456789 \times 10^{2n+2} \times 9801 + \left[991 \times 10^{2n+2} - 99n - 1090\right]}$$

Neglecting terms of a smaller magnitude and keeping the terms with a significantly higher magnitude, an approximate value of the Universal Division is given as:

$$UD_n \approx \frac{(987654321 \times 9801) + \left[10^9 \times (989 + 99n) \times 10^{2n+2}\right]}{123456789 \times 10^{2n+2} \times 9801}$$

$$UD_n \approx \frac{987654321 \times 9801}{123456789 \times 10^{2n+2} \times 9801} + \frac{10^9 \times (989 + 99n) \times 10^{2n+2}}{123456789 \times 10^{2n+2} \times 9801}$$

$$UD_n \approx \frac{987654321}{123456789}\left(\frac{1}{10^{2n+2}}\right) + \frac{10^9 \times (989 + 99n)}{123456789 \times 9801}$$

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$$UD_n \approx \frac{8}{10^{2n+2}} + \frac{1}{1210}\,(989 + 99n)$$
$$UD_n \approx \frac{8}{10^{2n+2}} + \frac{989}{1210} + \frac{99n}{1210}$$
$$UD_n \approx \frac{8}{10^{2n+2}} + 0.817 + \frac{9n}{110} \tag{2.7}$$

Thus from equation (2.7), we can write:

$$UD_{n+1} \approx \frac{8}{10^{2n+4}} + 0.817 + \frac{9\,(n+1)}{110} \tag{2.8}$$

Subtracting equations (2.8) and (2.7), we get:

$$U.D_{n+1} - UD_n = \left[\frac{8}{10^{2n+4}} + 0.817 + \frac{9\,(n+1)}{110}\right] - \left[\frac{8}{10^{2n+2}} + 0.817 + \frac{9n}{110}\right]$$
$$UD_{n+1} - UD_n = \left[\frac{9\,(n+1)}{110} - \frac{9n}{110}\right] + \frac{8}{10^{2n+2}}\left[\frac{1}{10^2} - 1\right]$$
$$UD_{n+1} - UD_n = \left(\frac{9n + 9 - 9n}{110}\right) - \frac{792}{10^{2n+4}}$$
$$UD_{n+1} - UD_n = \frac{9}{110} - \frac{7.92}{10^{2n+2}}$$
$$UCD_1 = \frac{9}{110} - \frac{7.92}{10^{2n+2}} \tag{2.9}$$

The second term of the right hand side of the above equation has it's denominator as 10 raised to the power of twice of $(n+1)$. As the value of n increases from 0, the value of the second term of the right hand side of the equation decreases rapidly while the first term is a constant. As n tends to its maximum value, the second term tends to infinity, leaving out just the first term. Hence we can write:

$$UD_{n+1} - UD_n \simeq \frac{9}{110}$$
$$UCD_1 = \frac{9}{110}$$
$$UCD_1 = 0.0\overline{81}$$

The Universal Theorem of Division is hence proved for the first order. Similar analysis for higher ordered Universal Divisions reveals constant values of UCD as well. □

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3. OBSERVATION

3.1. **GRAPH 1.** The following figure depicts the variation of the Universal Constant of Division (UCD) of Order 1 as per equation (2.9)

1.png

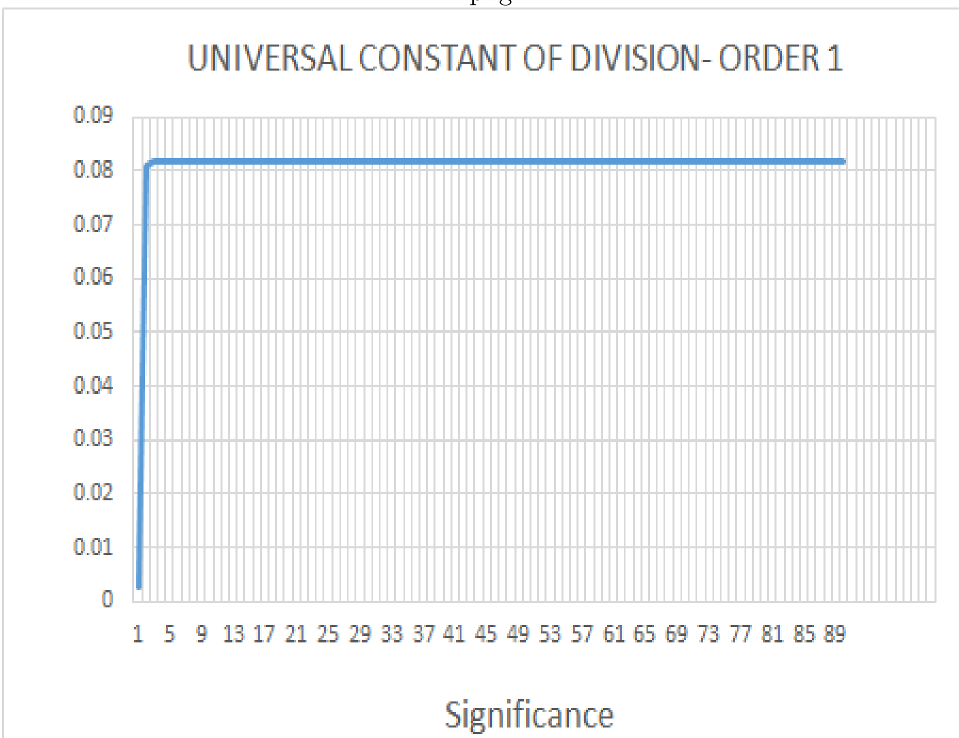

FIGURE 1. The graph of $UCD_1 = \frac{9}{110} - \frac{7.92}{10^{2n+2}}$

3.1.1. *Analysis.* The above graph starts with a value of $0.0026\overline{18}$ for Significance equal to 0, and steeps up for lower values of the Significance, eventually becoming constant for majority of the remaining values of the Significance, up till a Significance of 89. This constant value, as seen from the graph, is equal to $0.0\overline{81}$. The author's assumption of a Universal Constant of Division for order 1 is therefore correct and holds true for most Universal Divisions of order 1. Similar graphical plots can be obtained for Universal Divisions of higher orders.

3.2. **TABLE.** The following table represents the values of the quotients of the Universal divisions as given by the calculator, and as given by the equation (2.7) developed by the author in the present paper. The differences between two successive quotients have also been shown with the help of scientific computation as well as with the use of the Universal Constant Of Division approach. It can be clearly observed that in both the methods of calculating the differences between two successive Universal Divisions, the differences eventually assume a constant value equal to the Universal Constant of Division of Order 1.

1.png

Largest Two Digit Number in the Universal Division	Significance	Quotient of the Universal Division obtained from the Calculator	Difference between two successive Universal Divisions	Emperical Value of the Universal Division obtained in the paper as per equation (2.7)	Universal Constant of Division of the First Order (UCD)
10	0	0.890000007	-	0.897355373	0.002618182
11	1	0.899900007	0.0099	0.899973554	0.081026182
12	2	0.980999008	0.081099001	0.980999736	0.081810262
13	3	1.062809999	0.081810991	1.062809997	0.081818103
14	4	1.144628109	0.081818111	1.1446281	0.081818181
15	5	1.226446291	0.081818182	1.226446281	0.081818182
16	6	1.308264474	0.081818182	1.308264463	0.081818182
17	7	1.390082656	0.081818182	1.390082645	0.081818182
18	8	1.471900839	0.081818182	1.471900826	0.081818182
19	9	1.553719021	0.081818182	1.553719008	0.081818182
20	10	1.635537204	0.081818182	1.63553719	0.081818182
21	11	1.717355386	0.081818182	1.717355372	0.081818182
22	12	1.799173569	0.081818182	1.799173554	0.081818182
23	13	1.880991751	0.081818182	1.880991736	0.081818182
24	14	1.962809934	0.081818182	1.962809917	0.081818182
25	15	2.044628116	0.081818182	2.044628099	0.081818182
26	16	2.126446299	0.081818182	2.126446281	0.081818182
27	17	2.208264481	0.081818182	2.208264463	0.081818182
28	18	2.290082664	0.081818182	2.290082645	0.081818182
29	19	2.371900846	0.081818182	2.371900826	0.081818182
30	20	2.453719029	0.081818182	2.453719008	0.081818182
31	21	2.535537211	0.081818182	2.53553719	0.081818182
32	22	2.617355394	0.081818182	2.617355372	0.081818182
33	23	2.699173576	0.081818182	2.699173554	0.081818182
34	24	2.780991759	0.081818182	2.780991736	0.081818182

FIGURE 2. Table 1

2.png

Largest Two Digit Number in the Universal Division	Significance	Quotient of the Universal Division obtained from the Calculator	Difference between two successive Universal Divisions	Emperical Value of the Universal Division obtained in the paper as per equation (2.7)	Universal Constant of Division of the First Order (UCD)
35	25	2.862809941	0.081818182	2.862809917	0.081818182
36	26	2.944628124	0.081818182	2.944628099	0.081818182
37	27	3.026446306	0.081818182	3.026446281	0.081818182
38	28	3.108264489	0.081818182	3.108264463	0.081818182
39	29	3.190082671	0.081818182	3.190082645	0.081818182
40	30	3.271900854	0.081818182	3.271900826	0.081818182
41	31	3.353719036	0.081818182	3.353719008	0.081818182
42	32	3.435537219	0.081818182	3.43553719	0.081818182
43	33	3.517355401	0.081818182	3.517355372	0.081818182
44	34	3.599173584	0.081818182	3.599173554	0.081818182
45	35	3.680991766	0.081818182	3.680991736	0.081818182
46	36	3.762809949	0.081818182	3.762809917	0.081818182
47	37	3.844628131	0.081818182	3.844628099	0.081818182
48	38	3.926446314	0.081818182	3.926446281	0.081818182
49	39	4.008264496	0.081818182	4.008264463	0.081818182
50	40	4.090082678	0.081818182	4.090082645	0.081818182
51	41	4.171900861	0.081818182	4.171900826	0.081818182
52	42	4.253719043	0.081818182	4.253719008	0.081818182
53	43	4.335537226	0.081818182	4.33553719	0.081818182
54	44	4.417355408	0.081818182	4.417355372	0.081818182
55	45	4.499173591	0.081818182	4.499173554	0.081818182
56	46	4.580991773	0.081818182	4.580991736	0.081818182
57	47	4.662809956	0.081818182	4.662809917	0.081818182
58	48	4.744628138	0.081818182	4.744628099	0.081818182
59	49	4.826446321	0.081818182	4.826446281	0.081818182
60	50	4.908264503	0.081818182	4.908264463	0.081818182
61	51	4.990082686	0.081818182	4.990082645	0.081818182
62	52	5.071900868	0.081818182	5.071900826	0.081818182
63	53	5.153719051	0.081818182	5.153719008	0.081818182
64	54	5.235537233	0.081818182	5.23553719	0.081818182
65	55	5.317355416	0.081818182	5.317355372	0.081818182

FIGURE 3. Table 1 (Continued)

3.png

Largest Two Digit Number in the Universal Division	Significance	Quotient of the Universal Division obtained from the Calculator	Difference between two successive Universal Divisions	Emperical Value of the Universal Division obtained in the paper as per equation (2.7)	Universal Constant of Division of the First Order (UCD)
66	56	5.399173598	0.081818182	5.399173554	0.081818182
67	57	5.480991781	0.081818182	5.480991736	0.081818182
68	58	5.562809963	0.081818182	5.562809917	0.081818182
69	59	5.644628146	0.081818182	5.644628099	0.081818182
70	60	5.726446328	0.081818182	5.726446281	0.081818182
71	61	5.808264511	0.081818182	5.808264463	0.081818182
72	62	5.890082693	0.081818182	5.890082645	0.081818182
73	63	5.971900876	0.081818182	5.971900826	0.081818182
74	64	6.053719058	0.081818182	6.053719008	0.081818182
75	65	6.135537241	0.081818182	6.13553719	0.081818182
76	66	6.217355423	0.081818182	6.217355372	0.081818182
77	67	6.299173606	0.081818182	6.299173554	0.081818182
78	68	6.380991788	0.081818182	6.380991736	0.081818182
79	69	6.462809971	0.081818182	6.462809917	0.081818182
80	70	6.544628153	0.081818182	6.544628099	0.081818182
81	71	6.626446336	0.081818182	6.626446281	0.081818182
82	72	6.708264518	0.081818182	6.708264463	0.081818182
83	73	6.790082701	0.081818182	6.790082645	0.081818182
84	74	6.871900883	0.081818182	6.871900826	0.081818182
85	75	6.953719066	0.081818182	6.953719008	0.081818182
86	76	7.035537248	0.081818182	7.03553719	0.081818182
87	77	7.117355431	0.081818182	7.117355372	0.081818182
88	78	7.199173613	0.081818182	7.199173554	0.081818182
89	79	7.280991796	0.081818182	7.280991736	0.081818182
90	80	7.362809978	0.081818182	7.362809917	0.081818182
91	81	7.444628161	0.081818182	7.444628099	0.081818182
92	82	7.526446343	0.081818182	7.526446281	0.081818182
93	83	7.608264526	0.081818182	7.608264463	0.081818182
94	84	7.690082708	0.081818182	7.690082645	0.081818182
95	85	7.771900891	0.081818182	7.771900826	0.081818182
96	86	7.853719073	0.081818182	7.853719008	0.081818182
97	87	7.935537256	0.081818182	7.93553719	0.081818182
98	88	8.017355438	0.081818182	8.017355372	0.081818182
99	89	8.099173621	0.081818182	8.099173554	0.081818182

FIGURE 4. Table 1 (Continued)

4. ARITHMETIC PROGRESSION

The approximate representation of the Universal Division of the First Order can be given by the equation (2.7)

$$UD_n \approx \frac{8}{10^{2n+2}} + 0.817 + \frac{9n}{110}$$

The first term of the above expression tends to 0, as the value of the Significance n increases from 0 to 89. Thus the general representation of the Universal Division of the first order is as follows:

$$UD_n \approx \frac{9n}{110} + 0.817$$

This is a linear function in n whose graph can be referred from Figure 2. Algebraic manipulation of this linear expression allows the quotients of the Universal Division to be represented in the form of an Arithmetic Progression as follows:

$$UD_n = \frac{9n}{110} + 0.817$$

$$UD_n = \frac{9n - 9 + 9}{110} + 0.817$$

$$UD_n = \frac{9n - 9}{110} + \frac{9}{110} + 0.817$$

$$UD_n = \frac{9\,(n-1)}{110} + \frac{9}{110} + 0.817$$

$$UD_n = 0.898\overline{81} + (n-1)\,\frac{9}{110}$$

$$UD_n = UD_0 + (n-1)\,UCD_1 \tag{4.1}$$

Equation (4.1) represents the Universal Division of the first order in the form of an Arithmetic progression with n terms, whose first term is UD_0 and the common difference is the Universal Constant of Division of the first order UCD_1

$$UD_0 = 0.898\overline{81}$$

And

$$UCD_1 = 0.0\overline{81}$$

Using the equation (4.1),it is possible to manually calculate the tedious quotients of the largely complex Universal Divisions without the use of any scientific computation.

4.1. **GRAPH 2.** The following graph represents the linear variation of the quotients of the Universal Divisions of the first order as per the equation (2.7).

2.png

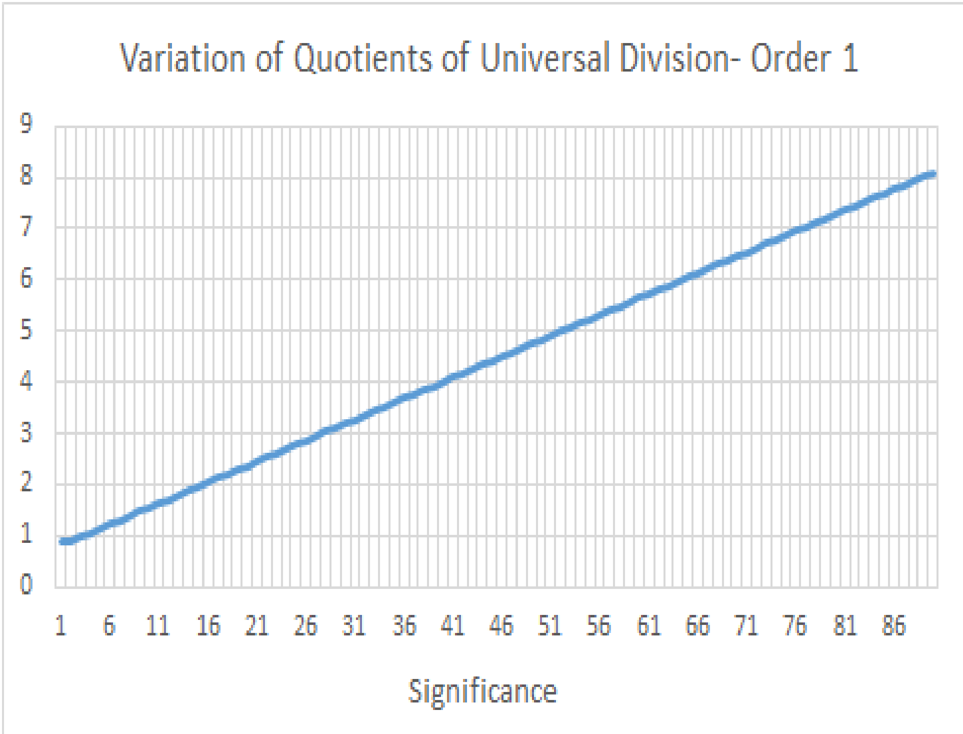

FIGURE 5. Graph of $UD_n = \frac{8}{10^{2n+2}} + 0.817 + \frac{9n}{110}$

4.1.1. *Analysis.* It can be inferred from the above graph that the quotients of the Universal Divisions follow a linear trend for most values of the Significance i.e they follow an Arithmetic Progression with a common difference equal to the Universal Constant of Division of Order 1. In other words, the slope of the linear portion of the above graph is equal to the Universal Constant of Division of Order 1.

5. INTROSPECTION

An interesting thing to note in this paper is the recurrence of the number 9801 in the expressions of the Ascendor and the Descendor as per the eqautions (2.3) and (2.6).

$$N = 987654321 + \frac{10^9}{9801}\left[(989 + 99n) \times 10^{2n+2} - 890\right]$$

$$D = 123456789 \times 10^{2n+2} + \frac{1}{9801}\left[991 \times 10^{2n+2} - 99n - 1090\right]$$

This is no mere coincidence and has a special meaning, yet unknown to the author but somewhere connected with the Universality of the present number system in existence. The reason for this special occurrence of 9801 is because this unique number is present in one of the most famous expressions of Mathematics- The Ramanujan Formula for the evaluation of Pi:

$$\frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum_{n=0}^{\infty} \frac{(4n)!}{(n!)^4} \times \frac{26390n + 1103}{396^{4n}}$$

The author was intrigued to find this number recurring in the present paper and has tried to find the true meaning of the special number 9801. A fact to note is that both Pi as well as the Universal Constant of Division of Order 1 found in the paper are irrational constants. This can not be a mere coincidence and the author therefore encourages the study of the number 9801 to the deepest possible extent in the subjects of number theory and number-series.

6. CONCLUSION

In conclusion, the author would like to summarize the paper through the following points:

1.The **Universal Divisions (UD)** of the First Order contain two-digit numbers in succession, and their quotients follow an **Arithmetic Progression**.
2. The value of the quotients of the complex Universal Divisions of the first order can be calculated with the simple equation (2.7) developed by the author.

$$UD_n = \frac{8}{10^{2n+2}} + 0.817 + \frac{9n}{110}$$

3. The common difference of the Arithmetic Progression of the quotients of the Universal Divisions of the first order is equal to $0.0\overline{81}$. This is called the **Universal Constant of Division (UCD) of the first order.**

References

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