Title: New cubic potentiation algorithm.
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Abstract: This document develops and demonstrates the discovery of a new cubic potentiation algorithm that works absolutely with all the numbers using the formula of the cubic of a binomial.

1) The cube of a binomial

$$(x+y)^3$$

Binomial Cubic

A binomial Cubic (sum) is equal to:

$$(x+y)^3 = (x+y)*(x+y)*(x+y) = \boxed{x^3 + 3\,x^2\,y + 3\,x\,y^2 + y^3}$$

1) Applying the cube of a binomial

Demonstration

The cubic of a binomial is always applied to two terms, in this case I try to show that it can be applied to a single term or rather to any number, the method consists in discovering the two terms that form that number. With the following examples and demonstrations it will be very easy to find the solutions.

The ideal is to divide the digits into two groups, the first will be the letter X and the second will be the letter Y.

Example
1.845
I can group it in several ways in two terms I can choose any of them to solve the exercise.
1.845, 1.845, 1.845

But when the last term has more than one number, in the final sum the numbers are sorted according to the number of digits it has. For example if you have the letter Y has a single digit, the sums are sorted by running a digit. If you have two digits, the sums are sorted by two digits, etc.
See example Nº7

In the cases of numbers of a single digit like the number 9, we add the 0 in front.

09

0 corresponds to **x**
9 corresponds to **y**

In cases where we have decimal numbers, the following happens, the whole number represents the first letter and the decimal part represents the second. But I can group them in different ways too

47,745

47 corresponds to **x**
745 corresponds to **y**

Example nº1

We will use the number 17. The number 1 is replaced by the letter **x**, the number 7 is replaced by the letter **y**

$$\mathbf{x^3 + 3\,x^2\,y + 3\,x\,y^2 + y^3}$$

$$17^3 = 1^3 + 3 * 1^2 * 7 + 3 * 1 * 7^2 + 7^3$$
$$17^3 = 1 + 21 + 147 + 343$$

Now we add using the following method.

$17^3 = 4.913$

	1				*1000
	2	1			*100
	1	4	7		*10
+		3	4	3	*1
	4	9	1	3	Result

The letter Y has a single digit so that the numbers of the sums slip a place.
We multiply the first term by 1000, the second term by 100, and the third term by 10. And the last term by 1. In all cases when we use the cube of a whole number.

Example nº2

We will use the number 35
The number 3 is replaced by the letter **x**, the number 5 is replaced by the letter **y**

$$\mathbf{x^3 + 3\,x^2\,y + 3\,x\,y^2 + y^3}$$

$$35^3 = 3^3 + 3 * 3^2 * 5 + 3 * 3 * 5^2 + 5^3$$

$$35^3 = 27 + 135 + 225 + 125$$

Now we add using the following method.

$35^3 = 42.875$

	2	7				*1000
	1	3	5			*100
		2	2	5		*10
+			1	2	5	*1
	4	2	8	7	5	Result

The letter Y has a single digit so that the numbers of the sums slip a place.
We multiply the first term by 1000, the second term by 100, and the third term by 10. And the last term by 1. In all cases when we use the cube of a whole number.

Example nº3

We will use the number 174
The number 17 is replaced by the letter **x**, the number 4 is replaced by the letter **y**

$$\mathbf{x^3 + 3\,x^2\,y + 3\,x\,y^2 + y^3}$$

$$174^3 = 17^3 + 3 * 17^2 * 4 + 3 * 17 * 4^2 + 4^3$$
$$174^3 = 4913 + 3468 + 816 + 64$$

Now we add using the following method.

$174^3 = 5.268.024$

	4	9	1	3				*1000
		3	4	6	8			*100
				8	1	6		*10
+						6	4	*1
	5	2	6	8	0	2	4	Result

The letter Y has a single digit so that the numbers of the sums slip a place.

2) Applying the cube of a binomial decimal numerals

Example nº4

We will use the number 2,8
The number 2 is replaced by the letter **x**, the number 0,8 is replaced by the letter **y**

$$\mathbf{x^3 + 3\,x^2\,y + 3\,x\,y^2 + y^3}$$

$$2{,}8^3 = 2^3 + 3 * 2^2 * 8 + 3 * 2 * 8^2 + 8^3$$
$$2{,}8^3 = 8 + 96 + 384 + 512$$

Now we add using the following method.

$2{,}8^3 = 21{,}952$

		8					*1000
		9	6				*100
		3	8	4			*10
+			5	1	2		*1
	2	1,	9	5	2		Result

The letter Y has a single digit so that the numbers of the sums slip a place.
When we have one decimal number, we multiply the first term by 1000, the second term by 100, and the third term by 10 and the last term by 1.

The comma is located at three places, since we have raised a cube decimal number, so if there were 2 decimal numbers the comma runs 6 places, if there were 3 decimal numbers, 9 places are run, etc.
The comma is located at 3 places, a ladder is formed on the right side of one base steps.

Example nº5

We will use the number 4,31
The number 4 is replaced by the letter **x**, the number 31 is replaced by the letter **y**

$$\mathbf{x^3 + 3\ x^2\ y + 3\ x\ y^2 + y^3}$$

$$4{,}31^3 = 4^3 + 3 * 4^2 * 31 + 3 * 4 * 31^2 + 31^3$$
$$4{,}31^3 = 64 + 1.488 + 11.532 + 29.791$$

Now we add using the following method.

$4{,}31^3 = 80{,}062991$

		6	4						*1.000.000
		1	4	8	8				*10.000
			1	1	5	3	2		*100
+					2	9	7	9	1	*1
	8	0,	0	6	2	9	9	1	Result

The letter Y has two digits whereby the numbers of the sums slide two places.
The comma is located at 6 places, a ladder is formed on the right side of two base steps.
By having two decimal numbers we are forced to multiply by 1.000.000 in the first term, by 10.000 in the second term, by 100 in the third term and the last term by 1 to achieve the final sum.

Example nº6

We will use the number 124,826 The number 124 is replaced by the letter **x**, the number 826 is replaced by the letter **y**

$$\mathbf{x^3 + 3\ x^2\ y + 3\ x\ y^2 + y^3}$$

$$124{,}826^3 = 124^3 + 3 * 124^2 * 826 + 3 * 124 * 826^2 + 826^3$$
$$124{,}826^3 = 1.906.624 + 38.101.728 + 253.806.672 + 563.559.976$$

Now we add using the following method.

$$124{,}826^3 = 1944980{,}098231976$$

	1	9	0	6	6	2	4									*1.000.000.000
			3	8	1	0	1	7	2	8						*100.000.000
					2	5	3	8	0	6	6	7	2			*1.000
+								5	6	3	5	5	9	9	7	6 *1
	1	9	4	4	9	8	0,	0	9	8	2	3	1	9	7	6 Result

The letter Y has three digits whereby the numbers of the sums slide three places.
By having three decimal numbers we are forced to multiply by 1.000.000.000 in the first term, by 1.000.000 in the second term, by 1.000 in the third term and the last term by 1 to achieve the final sum.

The comma is located at 9 places, a ladder is formed on the right side of three base steps.

Examples nº7 A

561 (In the letter Y I have only one digit)
The number 56 is replaced by the letter **x**, the number 1 is replaced by the letter **Y**

$$\mathbf{x^3 + 3\ x^2\ y + 3\ x\ y^2 + y^3}$$

$$561^3 = 56^3 + 3 * 56^2 * 1 + 3 * 56 * 1^2 + 1^3$$
$$561^3 = 175.616 + 9.408 + 168 + 1$$

Now we add using the following method.
$561^3 = 176.558.481$

	1	7	5	6	1	6			*1.000
				9	4	0	8		*100
						1	6	8	*10
+								1	*1
	1	7	6	5	5	8	4	8	1

The letter Y has a digit, to make the sum, the numbers are ordered every one digit.

Example Nº7 B

561 (In the letter Y I have two digits)
The number 5 is replaced by the letter **x**, the number 61 is replaced by the letter **Y**

$$\mathbf{x^3 + 3\ x^2\ y + 3\ x\ y^2 + y^3}$$

$$561^3 = 5^3 + 3 * 5^2 * 61 + 3 * 5 * 61^2 + 61^3$$
$$561^3 = 125 + 4.575 + 55.815 + 226.981$$

Now we add using the following method.
$561^3 = 176.558.481$

	1	2	5						*1.000.000
		4	5	7	5				*10.000
			5	5	8	1	5		*100
+				2	2	6	9	8	1	*1
	1	7	6	5	5	8	4	8	1

The letter Y has two digits, to make the addition, the numbers are ordered every two digits.
In example A and in example B we obtain the same result.

Conclusion

This new algorithm of cubic potentiation presents a surprising precision, which transforms it into a reliable system or method to perform power operations to the cube
This is simply different, it is a novel and interesting alternative.

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Reference

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