Patterns in Semi-Selfie Numbers

Received 29/06/17

Inder J. Taneja[1]

Abstract

*Author studied many ways of writing **selfie numbers** [17], sometimes known by **wild narcissistic numbers**. There are numbers very much near to selfie-number, but are not selfie numbers. These types of numbers, referred as **semi-selfie numbers**, where numbers are written in terms of expressions with positive and negative signs having same digits on both sides of the expressions, except the power values. This paper brings interesting patterns with **semi-selfie numbers**. The work is limited up to 10 digits.*

Contents

1 Number Patterns

In this section, we shall give examples of patterns in numbers in different situations. This we have divided in subsections: patterns with palindromic numbers, numbers patterns with power, and some crazy number patterns. For details are given in [8, 9].

1.1 Palindromic Number Patterns

Below are some examples of palindromic number patterns.

[1]*Formerly, Professor of Mathematics, Universidade Federal de Santa Catarina, 88.040-900 Florianópolis, SC, Brazil.*
E-mail: ijtaneja@gmail.com; Web-site: http://inderjtaneja.wordpress.com

1.

$$\begin{aligned}
121 &= 11 \times 11 && :=(aa \times aa)/(a \times a)\\
12321 &= 111 \times 111 && :=(aaa \times aaa)/(a \times a)\\
1234321 &= 1111 \times 1111 && :=(aaaa \times aaaa)/(a \times a)\\
123454321 &= 11111 \times 11111 && :=(aaaaa \times aaaaa)/(a \times a)\\
12345654321 &= 111111 \times 111111 && :=(aaaaaa \times aaaaaa)/(a \times a)\\
1234567654321 &= 1111111 \times 1111111 && :=(aaaaaaa \times aaaaaaa)/(a \times a)\\
123456787654321 &= 11111111 \times 11111111 && :=(aaaaaaaa \times aaaaaaaa)/(a \times a)\\
12345678987654321 &= 111111111 \times 111111111 && :=(aaaaaaaaa \times aaaaaaaaa)/(a \times a).
\end{aligned}$$

2.

$$\begin{aligned}
1331 &= 11 \times 11 \times 11 && :=aa \times aa \times aa/(a \times a \times a)\\
13431 &= 11 \times 11 \times 111 && :=aa \times aa \times aaa/(a \times a \times a)\\
134431 &= 11 \times 11 \times 1111 && :=aa \times aa \times aaaa/(a \times a \times a)\\
1344431 &= 11 \times 11 \times 11111 && :=aa \times aa \times aaaaa/(a \times a \times a)\\
13444431 &= 11 \times 11 \times 111111 && :=aa \times aa \times aaaaaa/(a \times a \times a)\\
134444431 &= 11 \times 11 \times 1111111 && :=aa \times aa \times aaaaaaa/(a \times a \times a)\\
1344444431 &= 11 \times 11 \times 11111111 && :=aa \times aa \times aaaaaaaa/(a \times a \times a)\\
13444444431 &= 11 \times 11 \times 111111111 && :=aa \times aa \times aaaaaaaaa/(a \times a \times a).
\end{aligned}$$

3.

$$\begin{aligned}
1001 &= 13 \times 77 && :=aa \times (aaaa - aaa + a)/(aa \times a)\\
10101 &= 13 \times 777 && :=aaa \times (aaaa - aaa + a)/(aa \times a)\\
101101 &= 13 \times 7777 && :=aaaa \times (aaaa - aaa + a)/(aa \times a)\\
1011101 &= 13 \times 77777 && :=aaaaa \times (aaaa - aaa + a)/(aa \times a)\\
10111101 &= 13 \times 777777 && :=aaaaaa \times (aaaa - aaa + a)/(aa \times a)\\
101111101 &= 13 \times 7777777 && :=aaaaaaa \times (aaaa - aaa + a)/(aa \times a)\\
1011111101 &= 13 \times 77777777 && :=aaaaaaaa \times (aaaa - aaa + a)/(aa \times a)\\
10111111101 &= 13 \times 777777777 && :=aaaaaaaaa \times (aaaa - aaa + a)/(aa \times a).
\end{aligned}$$

The letter "a" appearing in above three examples is such that $a \in \{1,2,3,4,5,6,7,8,9\}$, i.e., for any value of "a" from 1 to 9, the results remains the same. Also,

$$aaa = 10^2 \times a + 10 \times a + a, \quad a \in \{1,2,3,4,5,6,7,8,9\} \text{ etc.}$$

A general study of numbers in terms of letter "a" is given in [6].

1.2 Patterns with Power

Below are some examples of patterns with power, where one side we have powers and another interesting patterns.

1.

$$16^2 = 256$$
$$166^2 = 27556$$
$$1666^2 = 2775556$$
$$16666^2 = 277755556$$
$$166666^2 = 27777555556$$
$$1666666^2 = 2777775555556$$
$$16666666^2 = 277777755555556$$

2.

$$34^2 = 1156$$
$$334^2 = 111556$$
$$3334^2 = 11115556$$
$$33334^2 = 1111155556$$
$$333334^2 = 111111555556$$
$$3333334^2 = 11111115555556$$
$$33333334^2 = 1111111155555556$$

3.

$$43^2 = 1849$$
$$433^2 = 187489$$
$$4333^2 = 18774889$$
$$43333^2 = 1877748889$$
$$433333^2 = 187777488889$$
$$4333333^2 = 18777774888889$$
$$43333333^2 = 1877777748888889$$

4.

$$67^2 = 4489$$
$$667^2 = 444889$$
$$6667^2 = 44448889$$
$$66667^2 = 4444488889$$
$$666667^2 = 444444888889$$
$$6666667^2 = 44444448888889$$
$$66666667^2 = 4444444488888889$$

As in case of previous subsection, here also we can write above patterns in terms of letter "a". It can be seen in [9].

1.3 Number Patterns

Above two subsections give patterns in terms of palindromic numbers and powers. Below are examples of patterns in little different forms.

1.

$$7623 = 11 \times 9 \times 77$$
$$776223 = 111 \times 9 \times 777$$
$$77762223 = 1111 \times 9 \times 7777$$
$$7777622223 = 11111 \times 9 \times 77777$$
$$777776222223 = 111111 \times 9 \times 777777$$
$$77777762222223 = 1111111 \times 9 \times 7777777$$
$$7777777622222223 = 11111111 \times 9 \times 77777777$$
$$77777777622222223 = 11111111 \times 9 \times 777777777$$

2.

$$99 = 98 + 1$$
$$999 = 987 + 12$$
$$9999 = 9876 + 123$$
$$99999 = 98765 + 1234$$
$$999999 = 987654 + 12345$$
$$9999999 = 9876543 + 123456$$
$$99999999 = 98765432 + 1234567$$
$$999999999 = 987654321 + 12345678$$
$$9999999999 = 9876543210 + 123456789$$

For full work, refer to link below [8, 9].

2 Selfie Numbers

Recently, author studied different ways of expressing numbers in such a way that both sides are with same digits. One side is with number, and another side is an expression formed by same digits with some operations.

These types of numbers we call **selfie numbers**. Some times they are called as **wild narcissistic numbers**. These numbers are represented by their own digits by use of certain operations. Subsections below give different ways of writing **selfie numbers**. See below some examples:

$$\begin{aligned}
936 &:= (\sqrt{9})!^3 + 6! && = 6! + (3!)^{\sqrt{9}}.\\
1296 &:= \sqrt{(1+2)!^9/6} && = 6^{(\sqrt{9}+2-1)}.\\
2896 &:= 2 \times (8 + (\sqrt{9})!! + 6!) && = (6! + (\sqrt{9})!! + 8) \times 2.\\
331779 &:= 3 + (31-7)^{\sqrt{7+9}} && = \sqrt{9} + (7 \times 7 - 1)^3 \times 3.\\
342995 &:= (3^4 - 2 - 9)^{\sqrt{9}} - 5 && = -5 + (-9 + 9^2 - \sqrt{4})^3.\\
759375 &:= (-7 + 59 - 37)^5 && = (5 + 7 + 3)^{\sqrt{9}-5+7}.\\
759381 &:= 7 + (5 \times \sqrt{9})^{-3+8} - 1 && = -1 + (8 \times 3 - 9)^5 + 7.
\end{aligned}$$

Examples given above are with **factorial** and **square-root** [15, 16]. First column numbers are in **digit's order** and second columns are in **reverse order of digits**. For details refer author's work [4, 5, 7, 11, 12, 13]. Still, one can have interesting results just with **factorial** [13]. See below:

$$\begin{aligned}
1463 &= -1! + 4! + 6! + 3!!. & 352797 &= -3! + 5 - 2! - 7! + 9! - 7!.\\
10077 &= -1! - 0! - 0! + 7! + 7!. & 357592 &= -3! - 5! - 7! - 5! + 9! - 2!.\\
40585 &= 4! + 0! + 5! + 8! + 5!. & 357941 &= 3! + 5! - 7! + 9! - 4! - 1!.\\
80518 &= 8! - 0! - 5! - 1! + 8!. & 361469 &= 3! - 6! - 1! + 4! - 6! + 9!.\\
317489 &= -3! - 1! - 7! - 4! - 8! + 9!.
\end{aligned}$$

$$\begin{aligned}
364292 &= 3!! + 6! - 4! - 2! + 9! - 2!. & 408937 &= -4! + 0! + 8! + 9! + 3!! + 7!.\\
397584 &= -3!! + 9! - 7! + 5! + 8! + 4!. & 715799 &= -7! - 1! + 5! - 7! + 9! + 9!.\\
398173 &= 3! + 9! + 8! + 1! - 7! + 3!. & 720599 &= -7! - 2! + 0! - 5! + 9! + 9!.
\end{aligned}$$

$$\begin{aligned}
145 &= 1! + 4! + 5!. & 363239 &= 36 + 323 + 9!.\\
733 &= 7 + 3!! + 3!. & 363269 &= 363 + 26 + 9!.\\
5177 &= 5! + 17 + 7!. & 403199 &= 40319 + 9!.
\end{aligned}$$

More studies and summary of work on numbers in different situations, refer author's work [16, 17].

2.1 Patterns in Selfie Numbers

Numbers extended with same properties multiplying by zero, we consider as **patterns in numbers**. Few examples of this kind are studied long back in 1966 by Madachy [3], page 174-175. See below:

$$\begin{aligned}
3^4 \times 425 &= 34425 & 31^2 \times 325 &= 312325\\
3^4 \times 4250 &= 344250 & 31^2 \times 3250 &= 3123250\\
3^4 \times 42500 &= 3442500. & 31^2 \times 32500 &= 31232500.
\end{aligned}$$

2.1.1 Digit's Order

Numbers appearing in this subsection are represented in order of digits.

$$1285 = (1+2^8)\times 5$$
$$12850 = (1+2^8)\times 50$$
$$128500 = (1+2^8)\times 500$$

$$15585 = 1\times(5^5-8)\times 5$$
$$155850 = 1\times(5^5-8)\times 50$$
$$1558500 = 1\times(5^5-8)\times 500$$

$$8192 = 8^{1+\sqrt{9}}\times 2$$
$$81920 = 8^{1+\sqrt{9}}\times 20$$
$$819200 = 8^{1+\sqrt{9}}\times 200$$

$$29435 = \sqrt{29^4}\times 35$$
$$294350 = \sqrt{29^4}\times 350$$
$$2943500 = \sqrt{29^4}\times 3500$$

2.1.2 Decreasing Order of Digits

The numbers appearing in this subsection are represented decreasing order of digits.

$$1827 = 87\times 21$$
$$18270 = 87\times 210$$
$$182700 = 87\times 2100$$

$$19683 = \sqrt{9^8}\times(6-3)\times 1$$
$$196830 = \sqrt{9^8}\times(6-3)\times 10$$
$$1968300 = \sqrt{9^8}\times(6-3)\times 100$$

$$2916 = (9\times 6)^2\times 1$$
$$29160 = (9\times 6)^2\times 10$$
$$291600 = (9\times 6)^2\times 100$$

$$995544 = ((\sqrt{9}+9)^5+54)\times 4$$
$$9955440 = ((\sqrt{9}+9)^5+54)\times 40$$
$$99554400 = ((\sqrt{9}+9)^5+54)\times 400$$

For more details, refer to author's work [11, 12, 13].

3 Semi-Selfie Numbers

There are numbers very much near to selfie-number, but are not selfie numbers. These types of numbers, we refer as **semi-selfie numbers**, where numbers are written in terms of expressions with positive and negative signs having same digits on both sides, except the power values. See below some examples in different situations.

$$\begin{aligned}\textbf{16777216} := (16+7+7+7+21+6)^4 &= (16-7-7+7+2-1+6)^6\\ &= (16-7+7+7-21+6)^8\\ &= (16+7-7-7+2-1-6)^{12}\\ &= (16-7-7+7-2+1-6)^{24}\end{aligned}$$

$$\begin{aligned}\textbf{17210368} &:= (1+7+2+1+03+6+8)^5 = (17+2+10-3-6+8)^5\\ \textbf{17779581} &:= (1+77+7+95+81)^3 = (177+7-9+5+81)^3\\ \textbf{17984728} &:= (179+8+47+28)^3 = (179+84-7-2+8)^3\\ \textbf{20151121} &:= (20+15+11+21)^4 = (-2-01-51+121)^4\end{aligned}$$

$$\begin{aligned}
\mathbf{88209} &:= (88+209)^2 \\
\mathbf{7441984} &:= (744+1984)^2 \\
\mathbf{23804641} &:= (238+04641)^2 \\
\mathbf{28005264} &:= (28+005264)^2 \\
\mathbf{300814336} &:= (3008+14336)^2 \\
\mathbf{493817284} &:= (4938+17284)^2.
\end{aligned}$$

$$\begin{aligned}
\mathbf{82369} &:= (-82+369)^2 \\
\mathbf{1002001} &:= (1002-001)^2 \\
\mathbf{1162084} &:= (1162-084)^2 \\
\mathbf{1201216} &:= (-120+1216)^2 \\
\mathbf{1656369} &:= (1656-369)^2 \\
\mathbf{1860496} &:= (1860-496)^2 \\
\mathbf{100020001} &:= (10002-0001)^2 \\
\mathbf{123121216} &:= (12312-1216)^2 \\
\mathbf{330621489} &:= (-3306+21489)^2
\end{aligned}$$

$$\begin{aligned}
\mathbf{238328} &:= (23+8+3+28)^3 \\
\mathbf{250047} &:= (2+50+04+7)^3 \\
\mathbf{357911} &:= (3+57+9+1+1)^3 \\
\mathbf{373248} &:= (37+3+24+8)^3 \\
\mathbf{390625} &:= (3+9+06+2+5)^4 \\
\mathbf{431649} &:= (4+3+1+649)^2 \\
\mathbf{455625} &:= (45+5+625)^2 \\
\mathbf{494209} &:= (494+209)^2
\end{aligned}$$

$$\begin{aligned}
\mathbf{57289761} &:= (5-7+2+89-7+6-1)^4 \\
&:= (57+2-8+97-61)^4 \\
&:= (-5-72+89+76-1)^4 \\
\mathbf{57592921} &:= (5+7592-9+2-1)^2 \\
\mathbf{57623281} &:= (-5+7623-28+1)^2 \\
\mathbf{57653649} &:= (-5+7653-64+9)^2 \\
\mathbf{57775201} &:= (5+77+7520-1)^2 \\
\mathbf{57927321} &:= (5+7927-321)^2
\end{aligned}$$

More detailed study can be seen in author's work [18, 19]. The aim of this work is write **patterns in semi-selfie numbers**. This we have done in following section.

4 Pattern in Semi-Selfie Numbers

Below are patterns in semi-selfie numbers. In each case, only first four values are given. Further values follows in a symmetric way.

1.

$$\begin{aligned}
\mathbf{10} &= 10^1 \\
\mathbf{1000} &= (10+00)^3 \\
\mathbf{100000} &= (10+0000)^5 \\
\mathbf{10000000} &= (10+000000)^7
\end{aligned}$$

2.

$$\begin{aligned}
\mathbf{81} &= (8+1)^2 \\
\mathbf{9801} &= (98+01)^2 \\
\mathbf{99801} &= (998+001)^2 \\
\mathbf{999801} &= (9998+0001)^2
\end{aligned}$$

3.

$$\mathbf{121} = (12-1)^2$$
$$\mathbf{10201} = (102-01)^2$$
$$\mathbf{1002001} = (1002-001)^2$$
$$\mathbf{100020001} = (10002-0001)^2$$

4.

$$\mathbf{3025} = (30+25)^2$$
$$\mathbf{98903025} = (9890+30+25)^2$$
$$\mathbf{9989003025} = (99890+030+25)^2$$
$$\mathbf{999890003025} = (999890+0030+25)^2$$

5.

$$\mathbf{1331} = (13-3+1)^3$$
$$\mathbf{1030301} = (103-03+01)^3$$
$$\mathbf{1003003001} = (1003-003+001)^3$$
$$\mathbf{1000300030001} = (10003-0003+0001)^3$$

6.

$$\mathbf{3125} = (3-1-2+5)^5$$
$$\mathbf{312500000} = (3-1-2+50+0000)^5$$
$$\mathbf{31250000000000} = (3-1-2+500+0000+0000)^5$$
$$\mathbf{3125000000000000000} = (3-1-2+5000+0000+0000+0000)^5$$

7.

$$\mathbf{8281} = (82+8+1)^2$$
$$\mathbf{982081} = (982+08+1)^2$$
$$\mathbf{99820081} = (9982+008+1)^2$$
$$\mathbf{9998200081} = (99982+0008+1)^2$$

8.

$$\mathbf{11881} = (118-8-1)^2$$
$$\mathbf{1018081} = (1018-08-1)^2$$
$$\mathbf{100180081} = (10018-008-1)^2$$
$$\mathbf{10001800081} = (100018-0008-1)^2$$

9.

$$\mathbf{14641} = (14-6+4-1)^4$$
$$\mathbf{104060401} = (104-06+04-01)^4$$
$$\mathbf{1004006004001} = (1004-006+004-01)^4$$
$$\mathbf{10004000600040001} = (10004-0006+004-01)^4$$

10.

$$\mathbf{39204} = (3-9+204)^2$$
$$\mathbf{399920004} = (3-9+9-9+20004)^2$$
$$\mathbf{3999992000004} = (3-9+99-99+2000004)^2$$
$$\mathbf{39999999200000004} = (3-9+999-999+200000004)^2$$

11.

$$\mathbf{245025} = (2-4+502-5)^2$$
$$\mathbf{2499500025} = (2-4+9-9+50002-5)^2$$
$$\mathbf{24999950000025} = (2-4+99-99+5000002-5)^2$$
$$\mathbf{249999995000000025} = (2-4+999-999+500000002-5)^2$$

12.

$$\mathbf{363609} = (3-6-3+609)^2$$
$$\mathbf{36036009} = (3-6-03+6009)^2$$
$$\mathbf{3600360009} = (3-6-003+60009)^2$$
$$\mathbf{360003600009} = (3-6-0003+600009)^2$$

13.

$$\mathbf{390625} = (3-9+06+25)^4$$
$$\mathbf{3906250000} = (3-9+06+250+000)^4$$
$$\mathbf{39062500000000} = (3-9+06+2500+000+000)^4$$
$$\mathbf{3906250000000000000} = (3-9+06+25000+000+000+000)^4$$

14.

$$\mathbf{644809} = (-6+4-4+809)^2$$
$$\mathbf{64048009} = (-6+4-04+8009)^2$$
$$\mathbf{6400480009} = (-6+4-004+80009)^2$$
$$\mathbf{640004800009} = (-6+4-0004+800009)^2$$

15.

$$\mathbf{648025} = (-6+4+802+5)^2$$
$$\mathbf{64080025} = (-6+4+08002+5)^2$$
$$\mathbf{6400800025} = (-6+4+0080002+5)^2$$
$$\mathbf{640008000025} = (-6+4+000800002+5)^2$$

16.

$$\mathbf{912025} = (910+20+25)^2$$
$$\mathbf{99120025} = (9910+20+025)^2$$
$$\mathbf{9991200025} = (99910+20+0025)^2$$
$$\mathbf{999912000025} = (999910+20+00025)^2$$

17.

$$\mathbf{970299} = (97 + 02 + 9 - 9)^3$$
$$\mathbf{999700029999} = (9997 + 0002 + 99 - 99)^3$$
$$\mathbf{999997000002999999} = (999997 + 000002 + 999 - 999)^3$$
$$\mathbf{999999970000000299999999} = (99999997 + 00000002 + 9999 - 9999)^3$$

18.

$$\mathbf{972196} = (972 - 1 + 9 + 6)^2$$
$$\mathbf{99720196} = (9972 - 01 + 9 + 6)^2$$
$$\mathbf{9997200196} = (99972 - 001 + 9 + 6)^2$$
$$\mathbf{999972000196} = (999972 - 0001 + 9 + 6)^2$$

19.

$$\mathbf{978121} = (978 + 12 - 1)^2$$
$$\mathbf{99780121} = (9978 + 012 - 1)^2$$
$$\mathbf{9997800121} = (99978 + 0012 - 1)^2$$
$$\mathbf{999978000121} = (999978 + 00012 - 1)^2$$

20.

$$\mathbf{980100} = (980 + 10 + 0)^2$$
$$\mathbf{99800100} = (9980 + 010 + 0)^2$$
$$\mathbf{9998000100} = (99980 + 0010 + 0)^2$$
$$\mathbf{999980000100} = (999980 + 00010 + 0)^2$$

21.

$$\mathbf{1020100} = (1020 - 10 + 0)^2$$
$$\mathbf{100200100} = (10020 - 010 + 0)^2$$
$$\mathbf{10002000100} = (100020 - 0010 + 0)^2$$
$$\mathbf{1000020000100} = (1000020 - 00010 + 0)^2$$

22.

$$\mathbf{1022121} = (1022 - 12 + 1)^2$$
$$\mathbf{100220121} = (10022 - 012 + 1)^2$$
$$\mathbf{10002200121} = (100022 - 0012 + 1)^2$$
$$\mathbf{1000022000121} = (1000022 - 00012 + 1)^2$$

23.

$$\mathbf{1028196} = (1028 + 1 - 9 - 6)^2$$
$$\mathbf{100280196} = (10028 + 01 - 9 - 6)^2$$
$$\mathbf{10002800196} = (100028 + 001 - 9 - 6)^2$$
$$\mathbf{1000028000196} = (1000028 + 0001 - 9 - 6)^2$$

24.

$$\mathbf{1061208} = (106 - 12 + 08)^3$$
$$\mathbf{1006012008} = (1006 - 012 + 008)^3$$
$$\mathbf{1000600120008} = (10006 - 0012 + 0008)^3$$
$$\mathbf{1000060001200008} = (100006 - 00012 + 00008)^3$$

25.

$$\mathbf{15944049} = (-1 - 59 + 4 + 4049)^2$$
$$\mathbf{159994400049} = (-1 - 59 + 9 - 9 + 4 + 400049)^2$$
$$\mathbf{1599999440000049} = (-1 - 59 + 99 - 99 + 4 + 40000049)^2$$
$$\mathbf{15999999944000000049} = (-1 - 59 + 999 - 999 + 4 + 4000000049)^2$$

26.

$$\mathbf{25150225} = (2 - 5 + 1 + 5022 - 5)^2$$
$$\mathbf{2501500225} = (2 - 5 + 01 + 50022 - 5)^2$$
$$\mathbf{250015000225} = (2 - 5 + 001 + 500022 - 5)^2$$
$$\mathbf{25000150000225} = (2 - 5 + 0001 + 5000022 - 5)^2$$

27.

$$\mathbf{25502500} = (25 + 5025 + 00)^2$$
$$\mathbf{2505002500} = (25 + 050025 + 00)^2$$
$$\mathbf{250050002500} = (25 + 00500025 + 00)^2$$
$$\mathbf{25000500002500} = (25 + 0005000025 + 00)^2$$

28.

$$\mathbf{28005264} = (28 + 005264)^2$$
$$\mathbf{2800526400} = (280 + 052640 + 0)^2$$
$$\mathbf{280052640000} = (2800 + 526400 + 00)^2$$
$$\mathbf{28005264000000} = (28000 + 5264000 + 000)^2$$

29.

$$\mathbf{35916049} = (35 - 91 + 6049)^2$$
$$\mathbf{359991600049} = (35 + 9 - 9 - 91 + 600049)^2$$
$$\mathbf{3599999160000049} = (35 + 99 - 99 - 91 + 60000049)^2$$
$$\mathbf{35999999916000000049} = (35 + 999 - 999 - 91 + 6000000049)^2$$

30.

$$\mathbf{35976004} = (-3 - 5 + 9 - 7 + 6004)^2$$
$$\mathbf{359997600004} = (-3 - 5 + 9 - 9 + 9 - 7 + 600004)^2$$
$$\mathbf{3599999760000004} = (-3 - 5 + 99 - 99 + 9 - 7 + 60000004)^2$$
$$\mathbf{35999999976000000004} = (-3 - 5 + 999 - 999 + 9 - 7 + 6000000004)^2$$

31.

$$\mathbf{63968004} = (6+3-9-6+8004)^2$$
$$\mathbf{639996800004} = (6+3+9-9-9-6+800004)^2$$
$$\mathbf{6399999680000004} = (6+3+99-99-9-6+80000004)^2$$
$$\mathbf{63999999968000000004} = (6+3+999-999-9-6+8000000004)^2$$

32.

$$\mathbf{64480900} = (-64+4+8090+0)^2$$
$$\mathbf{6404800900} = (-64+4+080090+0)^2$$
$$\mathbf{640048000900} = (-64+4+00800090+0)^2$$
$$\mathbf{64000480000900} = (-64+4+0008000090+0)^2$$

33.

$$\mathbf{81090025} = (8-10+9002+5)^2$$
$$\mathbf{8100900025} = (8-10+090002+5)^2$$
$$\mathbf{810009000025} = (8-10+00900002+5)^2$$
$$\mathbf{81000090000025} = (8-10+0009000002+5)^2$$

34.

$$\mathbf{96059601} = (96+05-9+6+01)^4$$
$$\mathbf{9996000599960001} = (9996+0005-9+9-9+6+0001)^4$$
$$\mathbf{999996000005999996000001} = (999996+000005-9+99-99+6+000001)^4$$
$$\mathbf{99999996000000059999999600000001} = (99999996+00000005-9+999-999+6+00000001)^4$$

35.

$$\mathbf{98029801} = (9802+98+01)^2$$
$$\mathbf{9980209801} = (99802+098+01)^2$$
$$\mathbf{999802009801} = (999802+0098+01)^2$$
$$\mathbf{99998020009801} = (9999802+00098+01)^2$$

36.

$$\mathbf{98188281} = (9818+82+8+1)^2$$
$$\mathbf{9981808281} = (99818+082+8+1)^2$$
$$\mathbf{999818008281} = (999818+0082+8+1)^2$$
$$\mathbf{99998180008281} = (9999818+00082+8+1)^2$$

37.

$$\mathbf{98287396} = (9828-7-3+96)^2$$
$$\mathbf{9982807396} = (99828-07-3+96)^2$$
$$\mathbf{999828007396} = (999828-007-3+96)^2$$
$$\mathbf{99998280007396} = (9999828-0007-3+96)^2$$

38.

$$\mathbf{98366724} = (9836+6+72+4)^2$$
$$\mathbf{9983606724} = (99836+06+72+4)^2$$
$$\mathbf{999836006724} = (999836+006+72+4)^2$$
$$\mathbf{99998360006724} = (9999836+0006+72+4)^2$$

39.

$$\mathbf{98446084} = (9844-6+084)^2$$
$$\mathbf{9984406084} = (99844-06+084)^2$$
$$\mathbf{999844006084} = (999844-006+084)^2$$
$$\mathbf{99998440006084} = (9999844-0006+084)^2$$

40.

$$\mathbf{98485776} = (9848+5+77-6)^2$$
$$\mathbf{9984805776} = (99848+05+77-6)^2$$
$$\mathbf{999848005776} = (999848+005+77-6)^2$$
$$\mathbf{99998480005776} = (9999848+0005+77-6)^2$$

41.

$$\mathbf{98743969} = (9874+3-9+69)^2$$
$$\mathbf{9987403969} = (99874+03-9+69)^2$$
$$\mathbf{999874003969} = (999874+003-9+69)^2$$
$$\mathbf{99998740003969} = (9999874+0003-9+69)^2$$

42.

$$\mathbf{98843364} = (9884-3-3+64)^2$$
$$\mathbf{9988403364} = (99884-03-3+64)^2$$
$$\mathbf{999884003364} = (999884-003-3+64)^2$$
$$\mathbf{99998840003364} = (9999884-0003-3+64)^2$$

43.

$$\mathbf{99102025} = (9910+20+25)^2$$
$$\mathbf{9991002025} = (99910+020+25)^2$$
$$\mathbf{999910002025} = (999910+0020+25)^2$$
$$\mathbf{99999100002025} = (9999910+00020+25)^2$$

44.

$$\mathbf{99121936} = (9912-1+9+36)^2$$
$$\mathbf{9991201936} = (99912-01+9+36)^2$$
$$\mathbf{999912001936} = (999912-001+9+36)^2$$
$$\mathbf{99999120001936} = (9999912-0001+9+36)^2$$

45.

$$\mathbf{99281296} = (9928+1+29+6)^2$$
$$\mathbf{9992801296} = (99928+01+29+6)^2$$
$$\mathbf{999928001296} = (999928+001+29+6)^2$$
$$\mathbf{99999280001296} = (9999928+0001+29+6)^2$$

46.

$$\mathbf{100721296} = (10072-1-29-6)^2$$
$$\mathbf{10007201296} = (100072-01-29-6)^2$$
$$\mathbf{1000072001296} = (1000072-001-29-6)^2$$
$$\mathbf{100000720001296} = (10000072-0001-29-6)^2$$

47.

$$\mathbf{100881936} = (10088+1-9-36)^2$$
$$\mathbf{10008801936} = (100088+01-9-36)^2$$
$$\mathbf{1000088001936} = (1000088+001-9-36)^2$$
$$\mathbf{100000880001936} = (10000088+0001-9-36)^2$$

48.

$$\mathbf{108243216} = (108-2-4+3+2+1-6)^4$$
$$\mathbf{1008024032016} = (1008-02-4+3+2+01-6)^4$$
$$\mathbf{10008002400320016} = (10008-002-4+3+2+001-6)^4$$
$$\mathbf{100080002400003200016} = (100008-0002-4+3+2+0001-6)^4$$

49.

$$\mathbf{100902025} = (10090-20-25)^2$$
$$\mathbf{10009002025} = (100090-020-25)^2$$
$$\mathbf{1000090002025} = (1000090-0020-25)^2$$
$$\mathbf{100000900002025} = (10000090-00020-25)^2$$

50.

$$\mathbf{101103025} = (10110-30-25)^2$$
$$\mathbf{10011003025} = (100110-030-25)^2$$
$$\mathbf{1000110003025} = (1000110-0030-25)^2$$
$$\mathbf{100001100003025} = (10000110-00030-25)^2$$

51.

$$\mathbf{101163364} = (10116+3+3-64)^2$$
$$\mathbf{10011603364} = (100116+03+3-64)^2$$
$$\mathbf{1000116003364} = (1000116+003+3-64)^2$$
$$\mathbf{100001160003364} = (10000116+0003+3-64)^2$$

52.

$$\begin{aligned}
\mathbf{101263969} &= (10126-3+9-69)^2 \\
\mathbf{10012603969} &= (100126-03+9-69)^2 \\
\mathbf{1000126003969} &= (1000126-003+9-69)^2 \\
\mathbf{100001260003969} &= (10000126-0003+9-69)^2
\end{aligned}$$

53.

$$\begin{aligned}
\mathbf{101525776} &= (10152-5-77+6)^2 \\
\mathbf{10015205776} &= (100152-05-77+6)^2 \\
\mathbf{1000152005776} &= (1000152-005-77+6)^2 \\
\mathbf{100001520005776} &= (10000152-0005-77+6)^2
\end{aligned}$$

54.

$$\begin{aligned}
\mathbf{101566084} &= (10156+6-084)^2 \\
\mathbf{10015606084} &= (100156+06-084)^2 \\
\mathbf{1000156006084} &= (1000156+006-084)^2 \\
\mathbf{100001560006084} &= (10000156+0006-084)^2
\end{aligned}$$

55.

$$\begin{aligned}
\mathbf{101646724} &= (10164-6-72-4)^2 \\
\mathbf{10016406724} &= (100164-06-72-4)^2 \\
\mathbf{1000164006724} &= (1000164-006-72-4)^2 \\
\mathbf{100001640006724} &= (10000164-0006-72-4)^2
\end{aligned}$$

56.

$$\begin{aligned}
\mathbf{101727396} &= (10172+7+3-96)^2 \\
\mathbf{10017207396} &= (100172+07+3-96)^2 \\
\mathbf{1000172007396} &= (1000172+007+3-96)^2 \\
\mathbf{100001720007396} &= (10000172+0007+3-96)^2
\end{aligned}$$

57.

$$\begin{aligned}
\mathbf{101828281} &= (10182-82-8-1)^2 \\
\mathbf{10018208281} &= (100182-082-8-1)^2 \\
\mathbf{1000182008281} &= (1000182-0082-8-1)^2 \\
\mathbf{100001820008281} &= (10000182-00082-8-1)^2
\end{aligned}$$

58.

$$\begin{aligned}
\mathbf{101989801} &= (10198-98-01)^2 \\
\mathbf{10019809801} &= (100198-098-01)^2 \\
\mathbf{1000198009801} &= (1000198-0098-01)^2 \\
\mathbf{100001980009801} &= (10000198-00098-01)^2
\end{aligned}$$

59.

$$\mathbf{102475129} = (10247 + 5 - 129)^2$$
$$\mathbf{10024615129} = (100247 + 05 - 129)^2$$
$$\mathbf{1000246015129} = (1000247 + 005 - 129)^2$$
$$\mathbf{100002460015129} = (10000247 + 0005 - 129)^2$$

60.

$$\mathbf{104346225} = (10434 + 6 - 225)^2$$
$$\mathbf{10043046225} = (100434 + 06 - 225)^2$$
$$\mathbf{1000430046225} = (1000434 + 006 - 225)^2$$
$$\mathbf{100004300046225} = (10000434 + 0006 - 225)^2$$

61.

$$\mathbf{108243216} = (108 - 24 + 3 + 21 - 6)^4$$
$$\mathbf{1008024032016} = (1008 - 024 + 3 + 21 - 6)^4$$
$$\mathbf{10008002400320016} = (10008 - 0024 + 3 + 21 - 6)^4$$
$$\mathbf{100080002400032016} = (100008 - 00024 + 3 + 21 - 6)^4$$

62.

$$\mathbf{121110025} = (1 - 2 - 1 + 11002 + 5)^2$$
$$\mathbf{12101100025} = (1 - 2 - 1 + 0110002 + 5)^2$$
$$\mathbf{1210011000025} = (1 - 2 - 1 + 001100002 + 5)^2$$
$$\mathbf{121000110000025} = (1 - 2 - 1 + 00011000002 + 5)^2$$

63.

$$\mathbf{169130025} = (1 + 6 - 9 + 13002 + 5)^2$$
$$\mathbf{16901300025} = (1 + 6 - 9 + 0130002 + 5)^2$$
$$\mathbf{1690013000025} = (1 + 6 - 9 + 001300002 + 5)^2$$
$$\mathbf{169000130000025} = (1 + 6 - 9 + 00013000002 + 5)^2$$

64.

$$\mathbf{196140025} = (1 - 9 + 6 + 14002 + 5)^2$$
$$\mathbf{19601400025} = (1 - 9 + 6 + 0140002 + 5)^2$$
$$\mathbf{1960014000025} = (1 - 9 + 6 + 001400002 + 5)^2$$
$$\mathbf{196000140000025} = (1 - 9 + 6 + 00014000002 + 5)^2$$

65.

$$\mathbf{361190025} = (3 + 6 - 1 + 19002 - 5)^2$$
$$\mathbf{36101900025} = (3 + 6 - 1 + 0190002 - 5)^2$$
$$\mathbf{3610019000025} = (3 + 6 - 1 + 001900002 - 5)^2$$
$$\mathbf{361000190000025} = (3 + 6 - 1 + 00019000002 - 5)^2$$

66.

$$\mathbf{484220025} = (4+8-4+22002-5)^2$$
$$\mathbf{48402200025} = (4+8-4+0220002-5)^2$$
$$\mathbf{4840022000025} = (4+8-4+002200002-5)^2$$
$$\mathbf{484000220000025} = (4+8-4+00022000002-5)^2$$

67.

$$\mathbf{529230025} = (5+2-9+23002+5)^2$$
$$\mathbf{52902300025} = (5+2-9+0230002+5)^2$$
$$\mathbf{5290023000025} = (5+2-9+002300002+5)^2$$
$$\mathbf{529000230000025} = (5+2-9+00023000002+5)^2$$

68.

$$\mathbf{576240025} = (-5+7+6+24002-5)^2$$
$$\mathbf{57602400025} = (-5+7+6+0240002-5)^2$$
$$\mathbf{5760024000025} = (-5+7+6+002400002-5)^2$$
$$\mathbf{576000240000025} = (-5+7+6+00024000002-5)^2$$

69.

$$\mathbf{970299000} = (970+29-9+000)^3$$
$$\mathbf{999700029999000} = (99970+0029-9+9-9+000)^3$$
$$\mathbf{999997000002999999000} = (9999970+000029-9+99-99+000)^3$$
$$\mathbf{99999997000000029999999000} = (999999970+00000029-9+999-999+000)^3$$

70.

$$\mathbf{982107784} = (982+10+7+7-8-4)^3$$
$$\mathbf{998201079784} = (9982+010+7+7-8-4)^3$$
$$\mathbf{999820010799784} = (99982+0010+7+7-8-4)^3$$
$$\mathbf{999982000107999784} = (999982+00010+7+7-8-4)^3$$

71.

$$\mathbf{991026973} = (991+02-69+73)^3$$
$$\mathbf{999910002699973} = (99991+0002-69+9-9+73)^3$$
$$\mathbf{999999100000269999973} = (9999991+000002-69+99-99+73)^3$$
$$\mathbf{999999991000000026999999973} = (999999991+00000002-69+999-999+73)^3$$

72.

$$\mathbf{994011992} = (994+01+1+9-9+2)^3$$
$$\mathbf{999940001199992} = (99994+0001+1+99-99+2)^3$$
$$\mathbf{999999400000119999992} = (9999994+000001+1+999-999+2)^3$$
$$\mathbf{99999999400000011999999992} = (999999994+00000001+1+9999-9999+2)^3$$

73.

$$\mathbf{1024320025} = (10+2-4+32002-5)^2$$
$$\mathbf{102403200025} = (10+2-4+0320002-5)^2$$
$$\mathbf{10240032000025} = (10+2-4+003200002-5)^2$$
$$\mathbf{1024000320000025} = (10+2-4+00032000002-5)^2$$

74.

$$\mathbf{1089330025} = (-1+08-9+33002+5)^2$$
$$\mathbf{108903300025} = (-1+08-9+0330002+5)^2$$
$$\mathbf{10890033000025} = (-1+08-9+003300002+5)^2$$
$$\mathbf{1089000330000025} = (-1+08-9+00033000002+5)^2$$

75.

$$\mathbf{1015075125} = (1015-07+5-1-2-5)^3$$
$$\mathbf{1001500750125} = (10015-007+5-1-2-5)^3$$
$$\mathbf{1000150007500125} = (100015-0007+5-1-2-5)^3$$
$$\mathbf{10000150000075000125} = (1000015-00007+5-1-2-5)^3$$

76.

$$\mathbf{1018108216} = (1018+10-8+2-16)^3$$
$$\mathbf{1001801080216} = (10018+010-08+2-16)^3$$
$$\mathbf{1000180010800216} = (100018+0010-008+2-16)^3$$
$$\mathbf{10000180000108000216} = (1000018+00010-0008+2-16)^3$$

77.

$$\mathbf{1021147343} = (1021+1-4-7-3-4+3)^3$$
$$\mathbf{1002101470343} = (10021+01-4-7-03-4+3)^3$$
$$\mathbf{1000210014700343} = (100021+001-4-7-003-4+3)^3$$
$$\mathbf{10000210000147000343} = (1000021+0001-4-7-0003-4+3)^3$$

78.

$$\mathbf{1024192512} = (1024-1-9-2-5-1+2)^3$$
$$\mathbf{1002401920512} = (10024-01-9-2-05-1+2)^3$$
$$\mathbf{1000240019200512} = (100024-001-9-2-005-1+2)^3$$
$$\mathbf{10000240000192000512} = (1000024-0001-9-2-0005-1+2)^3$$

79.

$$\mathbf{1024320025} = (10+2-4+32002-5)^2$$
$$\mathbf{102403200025} = (10+2-4+0320002-5)^2$$
$$\mathbf{10240032000025} = (10+2-4+003200002-5)^2$$
$$\mathbf{1024000320000025} = (10+2-4+00032000002-5)^2$$

80.

$$\mathbf{1027243729} = (1027 + 2 + 43 - 72 + 9)^3$$
$$\mathbf{1002702430729} = (10027 + 2 + 043 - 072 + 9)^3$$
$$\mathbf{1000270024300729} = (100027 + 2 + 0043 - 0072 + 9)^3$$
$$\mathbf{1000027000243000729} = (1000027 + 2 + 00043 - 00072 + 9)^3$$

81.

$$\mathbf{1030301000} = (1030 - 30 + 10 + 00)^3$$
$$\mathbf{1003003001000} = (10030 - 030 + 010 + 00)^3$$
$$\mathbf{1000300030001000} = (100030 - 0030 + 0010 + 00)^3$$
$$\mathbf{1000030000300001000} = (1000030 - 00030 + 00010 + 00)^3$$

82.

$$\mathbf{1089330025} = (-1 + 08 - 9 + 33002 + 5)^2$$
$$\mathbf{108903300025} = (-1 + 008 - 9 + 330002 + 5)^2$$
$$\mathbf{10890033000025} = (-1 + 0008 - 9 + 3300002 + 5)^2$$
$$\mathbf{1089000330000025} = (-1 + 00008 - 9 + 33000002 + 5)^2$$

83.

$$\mathbf{1156340025} = (-1 + 15 - 6 + 34002 - 5)^2$$
$$\mathbf{115603400025} = (-1 + 15 - 6 + 0340002 - 5)^2$$
$$\mathbf{11560034000025} = (-1 + 15 - 6 + 003400002 - 5)^2$$
$$\mathbf{1156000340000025} = (-1 + 15 - 6 + 00034000002 - 5)^2$$

84.

$$\mathbf{1225350025} = (-1 + 2 + 2 - 5 + 35002 + 5)^2$$
$$\mathbf{122503500025} = (-1 + 2 + 2 - 5 + 0350002 + 5)^2$$
$$\mathbf{12250035000025} = (-1 + 2 + 2 - 5 + 003500002 + 5)^2$$
$$\mathbf{1225000350000025} = (-1 + 2 + 2 - 5 + 00035000002 + 5)^2$$

85.

$$\mathbf{1296360025} = (-1 + 2 - 9 + 6 + 36002 + 5)^2$$
$$\mathbf{129603600025} = (-1 + 2 - 9 + 6 + 0360002 + 5)^2$$
$$\mathbf{12960036000025} = (-1 + 2 - 9 + 6 + 003600002 + 5)^2$$
$$\mathbf{1296000360000025} = (-1 + 2 - 9 + 6 + 00036000002 + 5)^2$$

86.

$$\mathbf{1369370025} = (13 - 6 - 9 + 37002 + 5)^2$$
$$\mathbf{136903700025} = (13 - 6 - 9 + 0370002 + 5)^2$$
$$\mathbf{13690037000025} = (13 - 6 - 9 + 003700002 + 5)^2$$
$$\mathbf{1369000370000025} = (13 - 6 - 9 + 00037000002 + 5)^2$$

87.

$$\mathbf{1568239201} = (1 - 5 + 6 - 8 - 2 - 3 + 9 + 201)^4$$
$$\mathbf{159968002399920001} = (1 - 5 + 9 - 9 + 6 - 8 - 002 - 3 + 9 + 9 - 9 + 20001)^4$$
$$\mathbf{1599996800002399999200001} = (1 - 5 + 99 - 99 + 6 - 8 - 00002 - 3 + 9 + 99 - 99 + 2000001)^4$$
$$\mathbf{159999996800000023999999200000001} = (1 - 5 + 999 - 999 + 6 - 8 - 0000002 - 3 + 9 + 999 - 999 + 200000001)^4$$

88.

$$\mathbf{1599840004} = (-1+5-9-9+8+40004)^2$$
$$\mathbf{15999984000004} = (-1+5-9-9+9-9+8+4000004)^2$$
$$\mathbf{159999998400000004} = (-1+5-9-9+99-99+8+400000004)^2$$
$$\mathbf{15999999984000000004} = (-1+5-9-9+999-999+8+4000000004)^2$$

89.

$$\mathbf{1681410025} = (1+6-8-1+41002+5)^2$$
$$\mathbf{168104100025} = (1+6-8-1+0410002+5)^2$$
$$\mathbf{16810041000025} = (1+6-8-1+004100002+5)^2$$
$$\mathbf{1681000410000025} = (1+6-8-1+00041000002+5)^2$$

90.

$$\mathbf{1764420025} = (1+7-6-4+42002+5)^2$$
$$\mathbf{176404200025} = (1+7-6-4+0420002+5)^2$$
$$\mathbf{17640042000025} = (1+7-6-4+004200002+5)^2$$
$$\mathbf{1764000420000025} = (1+7-6-4+00042000002+5)^2$$

91.

$$\mathbf{1849430025} = (1-8-4+9+43002+5)^2$$
$$\mathbf{184904300025} = (1-8-4+9+0430002+5)^2$$
$$\mathbf{18490043000025} = (1-8-4+9+004300002+5)^2$$
$$\mathbf{1849000430000025} = (1-8-4+9+00043000002+5)^2$$

92.

$$\mathbf{2116460025} = (2+1-1+6+46002-5)^2$$
$$\mathbf{211604600025} = (2+1-1+6+0460002-5)^2$$
$$\mathbf{21160046000025} = (2+1-1+6+004600002-5)^2$$
$$\mathbf{2116000460000025} = (2+1-1+6+00046000002-5)^2$$

93.

$$\mathbf{2499500025} = (2-4+9-9+50002-5)^2$$
$$\mathbf{24999950000025} = (2-4+99-99+5000002-5)^2$$
$$\mathbf{249999995000000025} = (2-4+999-999+500000002-5)^2$$
$$\mathbf{24999999995000000000025} = (2-4+9999-9999+50000000002-5)^2$$

94.

$$\mathbf{2509408836} = (-2+50940-8-836)^2$$
$$\mathbf{250094008836} = (-2+500940-08-836)^2$$
$$\mathbf{25000940008836} = (-2+5000940-008-836)^2$$
$$\mathbf{2500009400008836} = (-2+50000940-0008-836)^2$$

95.

$$\mathbf{2916540025} = (2-9-1+6+54002+5)^2$$
$$\mathbf{291605400025} = (2-9-1+6+0540002+5)^2$$
$$\mathbf{29160054000025} = (2-9-1+6+005400002+5)^2$$
$$\mathbf{2916000540000025} = (2-9-1+6+00054000002+5)^2$$

96.

$$\mathbf{3249570025} = (-3-2+4+9+57002-5)^2$$
$$\mathbf{324905700025} = (-3-2+4+9+0570002-5)^2$$
$$\mathbf{32490057000025} = (-3-2+4+9+005700002-5)^2$$
$$\mathbf{3249000570000025} = (-3-2+4+9+00057000002-5)^2$$

97.

$$\mathbf{3364580025} = (3-3-6+4+58002+5)^2$$
$$\mathbf{336405800025} = (3-3-6+4+0580002+5)^2$$
$$\mathbf{33640058000025} = (3-3-6+4+005800002+5)^2$$
$$\mathbf{3364000580000025} = (3-3-6+4+00058000002+5)^2$$

98.

$$\mathbf{3364580025} = (3+3+6-4+58002-5)^2$$
$$\mathbf{336405800025} = (3+3+6-4+0580002-5)^2$$
$$\mathbf{33640058000025} = (3+3+6-4+005800002-5)^2$$
$$\mathbf{3364000580000025} = (3+3+6-4+00058000002-5)^2$$

99.

$$\mathbf{3481590025} = (3+4-8-1+59002+5)^2$$
$$\mathbf{348105900025} = (3+4-8-1+0590002+5)^2$$
$$\mathbf{34810059000025} = (3+4-8-1+005900002+5)^2$$
$$\mathbf{3481000590000025} = (3+4-8-1+00059000002+5)^2$$

100.

$$\mathbf{3603600900} = (3-60-3+60090+0)^2$$
$$\mathbf{360036000900} = (3-60-3+0600090+0)^2$$
$$\mathbf{36000360000900} = (3-60-3+006000090+0)^2$$
$$\mathbf{3600003600000900} = (3-60-3+00060000090+0)^2$$

101.

$$\mathbf{390625} = (3-9+06+25)^4$$
$$\mathbf{3906250000} = (3-9+06+250+000)^4$$
$$\mathbf{39062500000000} = (3-9+06+2500+000+000)^4$$
$$\mathbf{3906250000000000000000} = (3-9+06+250000+000+000+000)^4$$

102.

$$\mathbf{4356660025} = (4+3-5+6+66002-5)^2$$
$$\mathbf{435606600025} = (4+3-5+6+0660002-5)^2$$
$$\mathbf{43560066000025} = (4+3-5+6+006600002-5)^2$$
$$\mathbf{4356000660000025} = (4+3-5+6+00066000002-5)^2$$

103.

$$\mathbf{4624680025} = (4+6+2-4+68002-5)^2$$
$$\mathbf{462406800025} = (4+6+2-4+0680002-5)^2$$
$$\mathbf{46240068000025} = (4+6+2-4+006800002-5)^2$$
$$\mathbf{4624000680000025} = (4+6+2-4+00068000002-5)^2$$

104.

$$\mathbf{4761690025} = (-4+7-6+1+69002+5)^2$$
$$\mathbf{476106900025} = (-4+7-6+1+0690002+5)^2$$
$$\mathbf{47610069000025} = (-4+7-6+1+006900002+5)^2$$
$$\mathbf{4761000690000025} = (-4+7-6+1+00069000002+5)^2$$

105.

$$\mathbf{4937170225} = (49-3-7+1+70225)^2$$
$$\mathbf{490371070225} = (49-03-7+1+700225)^2$$
$$\mathbf{49003710070225} = (49-003-7+1+7000225)^2$$
$$\mathbf{4900037100070225} = (49-0003-7+1+70000225)^2$$

106.

$$\mathbf{5041710025} = (5+04-1+71002-5)^2$$
$$\mathbf{504107100025} = (5+04-1+0710002-5)^2$$
$$\mathbf{50410071000025} = (5+04-1+007100002-5)^2$$
$$\mathbf{5041000710000025} = (5+04-1+00071000002-5)^2$$

107.

$$\mathbf{5184720025} = (5-1+8-4+72002-5)^2$$
$$\mathbf{518407200025} = (5-1+8-4+0720002-5)^2$$
$$\mathbf{51840072000025} = (5-1+8-4+007200002-5)^2$$
$$\mathbf{5184000720000025} = (5-1+8-4+00072000002-5)^2$$

108.

$$\mathbf{5476740025} = (5+4-7+6+74002-5)^2$$
$$\mathbf{547607400025} = (5+4-7+6+0740002-5)^2$$
$$\mathbf{54760074000025} = (5+4-7+6+007400002-5)^2$$
$$\mathbf{5476000740000025} = (5+4-7+6+00074000002-5)^2$$

109.

$$\mathbf{5625750025} = (5+6+2-5+75002-5)^2$$
$$\mathbf{562507500025} = (5+6+2-5+0750002-5)^2$$
$$\mathbf{56250075000025} = (5+6+2-5+007500002-5)^2$$
$$\mathbf{5625000750000025} = (5+6+2-5+00075000002-5)^2$$

110.

$$\mathbf{6084780025} = (-6+08-4+78002+5)^2$$
$$\mathbf{608407800025} = (-6+08-04+780002+5)^2$$
$$\mathbf{60840078000025} = (-6+08-004+7800002+5)^2$$
$$\mathbf{6084000780000025} = (-6+08-0004+78000002+5)^2$$

111.

$$\mathbf{6396800400} = (-63+9-6+80040+0)^2$$
$$\mathbf{63999680000400} = (-63+9-9+9-6+8000040+0)^2$$
$$\mathbf{639999968000000400} = (-63+99-99+9-6+800000040+0)^2$$
$$\mathbf{6399999996800000000400} = (-63+999-999+9-6+80000000040+0)^2$$

112.

$$\mathbf{6398880049} = (-63-9+8+8+80049)^2$$
$$\mathbf{63999888000049} = (-63+9-9-9+8+8+8000049)^2$$
$$\mathbf{639999988800000049} = (-63+99-99-9+8+8+800000049)^2$$
$$\mathbf{6399999998880000000049} = (-63+999-999-9+8+8+80000000049)^2$$

113.

$$\mathbf{6561810025} = (6-5+6+1+81002-5)^2$$
$$\mathbf{656108100025} = (6-5+6+1+0810002-5)^2$$
$$\mathbf{65610081000025} = (6-5+6+1+008100002-5)^2$$
$$\mathbf{6561000810000025} = (6-5+6+1+00081000002-5)^2$$

114.

$$\mathbf{7225850025} = (7-2-2+5+85002-5)^2$$
$$\mathbf{722508500025} = (7-2-2+5+850002-5)^2$$
$$\mathbf{72250085000025} = (7-2-2+5+8500002-5)^2$$
$$\mathbf{7225000850000025} = (7-2-2+5+85000002-5)^2$$

115.

$$\mathbf{7744880025} = (7-7+4+4+88002-5)^2$$
$$\mathbf{774408800025} = (7-7+4+4+0880002-5)^2$$
$$\mathbf{77440088000025} = (7-7+4+4+008800002-5)^2$$
$$\mathbf{7744000880000025} = (7-7+4+4+00088000002-5)^2$$

116.

$$\mathbf{8464920025} = (-8-4+6+4+92002+5)^2$$
$$\mathbf{846409200025} = (-8-4+6+4+0920002+5)^2$$
$$\mathbf{84640092000025} = (-8-4+6+4+009200002+5)^2$$
$$\mathbf{8464000920000025} = (-8-4+6+4+00092000002+5)^2$$

117.

$$\mathbf{9025950025} = (-9+02+5+95002+5)^2$$
$$\mathbf{902509500025} = (-9+02+5+0950002+5)^2$$
$$\mathbf{90250095000025} = (-9+02+5+009500002+5)^2$$
$$\mathbf{9025000950000025} = (-9+02+5+00095000002+5)^2$$

118.

$$\mathbf{9039207968} = (90+39-20-79+68)^5$$
$$\mathbf{99900039992000799968} = (9990+0039+9-9-20-0079+9-9+68)^5$$
$$\mathbf{9999900000399999200000079999968} = (999990+000039+99-99-20-000079+99-99+68)^5$$
$$\mathbf{999999900000003999999920000000799999968} = (99999990+00000039+999-999-20-00000079+999-999+68)^5$$

119.

$$\mathbf{9216960025} = (-9+2-1+6+96002+5)^2$$
$$\mathbf{921609600025} = (-9+2-1+6+0960002+5)^2$$
$$\mathbf{92160096000025} = (-9+2-1+6+009600002+5)^2$$
$$\mathbf{9216000960000025} = (-9+2-1+6+00096000002+5)^2$$

120.

$$\mathbf{9509900499} = (95+09-9+004+9-9)^5$$
$$\mathbf{99950009999000049999} = (9995+00099-99+00004+99-99)^5$$
$$\mathbf{99999500000999999000004999999} = (999995+00000999-999+0000004+999-999)^5$$
$$\mathbf{9999999500000009999999900000000499999999} = (99999995+00000009999-9999+000000004+9999-9999)^5$$

121.

$$\mathbf{9801990025} = (-9+8-01+99002+5)^2$$
$$\mathbf{980109900025} = (-9+8-01+0990002+5)^2$$
$$\mathbf{98010099000025} = (-9+8-01+009900002+5)^2$$
$$\mathbf{9801000990000025} = (-9+8-01+00099000002+5)^2$$

122.

$$\mathbf{9940688209} = (99406+88+209)^2$$
$$\mathbf{999406088209} = (999406+088+209)^2$$
$$\mathbf{99994060088209} = (9999406+0088+209)^2$$
$$\mathbf{9999940600088209} = (99999406+00088+209)^2$$

123.

$$\mathbf{9942682369} = (99426-82+369)^2$$
$$\mathbf{999426082369} = (999426-082+369)^2$$
$$\mathbf{99994260082369} = (9999426-0082+369)^2$$
$$\mathbf{9999942600082369} = (99999426-00082+369)^2$$

124.

$$\begin{aligned}
\mathbf{9953055225} &= (99530+5+5+225)^2 \\
\mathbf{999530055225} &= (999530+05+5+225)^2 \\
\mathbf{99995300055225} &= (9999530+005+5+225)^2 \\
\mathbf{9999953000055225} &= (99999530+0005+5+225)^2
\end{aligned}$$

125.

$$\begin{aligned}
\mathbf{9957046225} &= (99570-4-6+225)^2 \\
\mathbf{999570046225} &= (999570-04-6+225)^2 \\
\mathbf{99995700046225} &= (9999570-004-6+225)^2 \\
\mathbf{9999957000046225} &= (99999570-0004-6+225)^2
\end{aligned}$$

126.

$$\begin{aligned}
\mathbf{9960439204} &= (99604+3-9+204)^2 \\
\mathbf{999604039204} &= (999604+03-9+204)^2 \\
\mathbf{99996040039204} &= (9999604+003-9+204)^2 \\
\mathbf{9999960400039204} &= (99999604+0003-9+204)^2
\end{aligned}$$

127.

$$\begin{aligned}
\mathbf{9973217956} &= (99732-1+79+56)^2 \\
\mathbf{999732017956} &= (999732-01+79+56)^2 \\
\mathbf{99997320017956} &= (9999732-001+79+56)^2 \\
\mathbf{9999973200017956} &= (99999732-0001+79+56)^2
\end{aligned}$$

128.

$$\begin{aligned}
\mathbf{9973817161} &= (99738-1+71+61)^2 \\
\mathbf{999738017161} &= (999738-01+71+61)^2 \\
\mathbf{99997380017161} &= (9999738-001+71+61)^2 \\
\mathbf{9999973800017161} &= (99999738-0001+71+61)^2
\end{aligned}$$

129.

$$\begin{aligned}
\mathbf{9975415129} &= (99754-1-5+129)^2 \\
\mathbf{999754015129} &= (999754-01-5+129)^2 \\
\mathbf{99997540015129} &= (9999754-001-5+129)^2 \\
\mathbf{9999975400015129} &= (99999754-0001-5+129)^2
\end{aligned}$$

130.

$$\begin{aligned}
\mathbf{9977212996} &= (99772+129-9-6)^2 \\
\mathbf{999772012996} &= (999772+0129-9-6)^2 \\
\mathbf{99997720012996} &= (9999772+00129-9-6)^2 \\
\mathbf{9999977200012996} &= (99999772+000129-9-6)^2
\end{aligned}$$

131.

$$\begin{aligned}
\mathbf{9978211881} &= (99782 + 118 - 8 - 1)^2 \\
\mathbf{999782011881} &= (999782 + 0118 - 8 - 1)^2 \\
\mathbf{99997820011881} &= (9999782 + 00118 - 8 - 1)^2 \\
\mathbf{9999978200011881} &= (99999782 + 000118 - 8 - 1)^2
\end{aligned}$$

132.

$$\begin{aligned}
\mathbf{9979810201} &= (99798 + 102 - 01)^2 \\
\mathbf{999798010201} &= (999798 + 0102 - 01)^2 \\
\mathbf{99997980010201} &= (9999798 + 00102 - 01)^2 \\
\mathbf{9999979800010201} &= (99999798 + 000102 - 01)^2
\end{aligned}$$

133.

$$\begin{aligned}
\mathbf{9980010000} &= (99800 + 100 + 00)^2 \\
\mathbf{999800010000} &= (999800 + 0100 + 00)^2 \\
\mathbf{99998000010000} &= (9999800 + 00100 + 00)^2 \\
\mathbf{9999980000010000} &= (99999800 + 000100 + 00)^2
\end{aligned}$$

Acknowledgement

The author is thankful to T.J. Eckman, Georgia, USA (email: jeek@jeek.net) in programming the script to develop these representations.

References

[1] H. HEINZ, Narcissistic Numbers: Sums and Powers, *http://www.magic-squares.net/narciss.htm*.

[2] H.E. DUDENEY, Amusements in Mathematics, EBD E-Books Directory.com, 1917.

[3] J.S. MADACHY, Mathematics on Vacations, Charlers Scriber's Son, New York, 1966.

[4] I.J. TANEJA, Selfie Numbers: Consecutive Representations in Increasing and Decreasing Orders, RGMIA Research Report Collection, **17**(2014), Article 140, pp. 1-57. *http://rgmia.org/papers/v17/v17a140.pdf*.

[5] I.J. TANEJA, Different Types of Pretty Wild Narcissistic Numbers: Selfie Representations - I, RGMIA Research Report Collection, **18**(2015), Article 32, pp.1-43. *http://rgmia.org/papers/v18/v18a32.pdf*.

[6] TANEJA, I.J., Single Letter Representations of Natural Numbers, Palindromic Symmetries and Number Patterns, RGMIA Research Report Collection, **18**(2015), Article 40, pp. 1-30. *http://rgmia.org/papers/v18/v18a40.pdf*.

[7] I.J. TANEJA, Selfie Numbers: Representations in Increasing and Decreasing Orders of Non Consecutive Digits, RGMIA Research Report Collection, **18**(2015), Article 70, pp.1-104. *http://rgmia.org/papers/v18/v18a70.pdf*.

[8] I.J. TANEJA, Representations of Palindromic, Prime and Number Patterns, RGMIA Research Report Collection, **18**(2015), Article 77, pp.1-21. *http://rgmia.org/papers/v18/v18a77.pdf*

[9] TANEJA, I.J., Representations of Palindromic, Prime, and Fibonacci Sequence Patterns, RGMIA Research Report Collection, **18**(2015), Article 99, pp. 1-24. *http://rgmia.org/papers/v18/v18a99.pdf*.

[10] I.J. TANEJA, Patterns in Selfie Numbers, RGMIA Research Report Collection, **18**(2015), Article 154, pp. 1-41. *http://rgmia.org/papers/v18/v18a154.pdf*.

[11] I.J. TANEJA, Selfie Numbers - I: Symmetrical and Unified Representations, RGMIA Research Report Collection, **18**(2015), Article 174, pp.1-94. *http://rgmia.org/papers/v18/v18a174.pdf*.

[12] I.J. TANEJA, Selfie Numbers - II: Six Digits Symmetrical, Unified and Patterned Representations Without Factorial, RGMIA Research Report Collection, **18**(2015), Article 175, pp.1-41. *http://rgmia.org/papers/v18/v18a175.pdf*.

[13] I.J. TANEJA, Selfie Numbers - III: With Factorial and Without Square-Root - Up To Five Digits, RGMIA Research Report Collection, **19**(2016), Article 16, pp.1-52, *http://rgmia.org/papers/v19/v19a16.pdf*.

[14] I.J. TANEJA, Palindromic-Type Numbers and Pattarens - I, RGMIA Research Report Collection, **19**(2016), Article 163, pp.1-80, *http://rgmia.org/papers/v19/v19a159.pdf*.

[15] I.J. TANEJA, Selfie Numbers - IV: Addition, Subtraction and Factorial, RGMIA Research Report Collection, **19**(2016), Article 163, pp.1-42, *http://rgmia.org/papers/v19/v19a163.pdf*.

[16] I.J. TANEJA, Selfie Numbers - V: Six Digits Symmetrical Representations with Factorial, RGMIA Research Report Collection, **19**(2016), Article 164, pp.1-60, *http://rgmia.org/papers/v19/v19a164.pdf*.

[17] I.J. TANEJA, Crazy Representations of Natural Numbers, Selfie Numbers, Fibonacci Sequence, and Selfie Fractions, *RGMIA Research Report Collection*, **19**(2016), Article 179, pp.1-37, *http://rgmia.org/papers/v19/v19a179.pdf*.

[18] I.J. TANEJA, Semi-Selfie Numbers and Multiplicative Selfie Equalities, RGMIA Research Report Collection, **20**(2017), Article 37, pp.1-63, *http://rgmia.org/papers/v20/v20a37.pdf*.

[19] I.J. TANEJA, Semi-Selfie Numbers - I, RGMIA Research Report Collection, **20**(2017), Art. 83, pp. 1-96, *http://rgmia.org/papers/v20/v20a83.pdf*.
