Analysis of the Number of Unique Numbers Generated by Any of Two Identical Number Sets {0-X} Compounded in Any of the Six Major Mathematical Operations (powers, roots, multiplication, division, addition, and subtraction) as Counting Sequences

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ABSTRACT: This paper discusses how the analysis of the number of unique (counted one for all number identities with identical cosequentials) numbers as a result of the combination of any two numbers up to index can be found to follow divergently asymmetrical sequences in terms of the complexity of the operation to increase or decrease in value of the numbers.

FINDINGS:

The article expresses, in order: the sequences, from most complex decreasing operation to most complex increasing operation. This article now discloses the first 64 values of the sequences:

-Roots sequence:

1, 3, 5, 9, 13, 21, 30, 42, 54, 65, 81, 101, 120, 144, 168, 195, 215, 247, 277, 313, 348, 387, 426, 470, 512, 548, 594, 636, 686, 742, 794, 854, 906, 968, 1030, 1097, 1143, 1215, 1284, 1358, 1430, 1510, 1585, 1669, 1750, 1835, 1920, 2012, 2099, 2171, 2262, 2360, 2456, 2560, 2658, 2765, 2869, 2979, 3087, 3203, 3312, 3432, 3548, 3670…

-Quotient sequence:

1, 3, 5, 9, 13, 21, 25, 37, 45, 57, 65, 85, 93, 117, 129, 145, 161, 193, 205, 241, 257, 281, 301, 345, 361, 401, 425, 461, 485, 541, 557, 617, 649, 689, 721, 769, 793, 865, 901, 949, 981, 1061, 1085, 1169, 1209, 1257, 1301, 1393, 1425, 1509, 1549, *1613, 1661, 1765, 1801, 1881, 1929, 2001, 2057, 2173, 2205, 2325, 2385, 2457…*

-Difference sequence:

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127…

-Addend sequence:

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127…

-Product sequence:

1, 2, 4, 7, 10, 15, 19, 26, 31, 37, 43, 54, 60, 73, 81, 90, 98, 115, 124, 143, 153, 165, 177, 200, 210, 226, 240, 255, 268, 297, 309, 340, 355, 373, 391, 411, 424, 461, 481, 502, 518, 559, 576, 619, 639, 660, 684, 731, 748, 779, 801, 828, 851, 904, 926, 957, 979, 1009, 1039, 1098, 1117, 1178, 1210, 1238…

-Powers sequence:

1, 2, 4, 8, 12, 20, 29, 41, 51, 61, 77, 97, 116, 140, 164, 190, 208, 240, 271, 307, 341, 379, 418, 462, 504, 540, 586, 622, 671, 727, 780, 840, 882, 942, 1004, 1068, 1114, 1186, 1255, 1327, 1398, 1478, 1554, 1638, 1718, 1800, 1885, 1977, 2064, 2136, 2226, 2322, 2417, 2521, 2620, 2724, 2827, 2935, 3043, 3159, 3268, 3388, 3504, 3624…

These are clearly interesting and expansive sequences. It may be of significance that the addition and subtraction sequences are the same and expressed or somehow satisfied by three simple functions, one of which is $Y=|2x+1|$. It may also be of interest that multiplication and powers sequences diverge at the fourth unit and do not reconverge. Stranger yet, the roots and division sequences are seen to diverge at their seventh values. Two of these, the addition and subtraction sequences are linear, and the others are not of a standard and simply derived curvature.