Study on Novel Geometric and Numeric Methods

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Abstract: *This paper discusses a variety of newly discovered numbers that have unique properties in algebra that may have interesting applications in geometric and mathematical problem-solving, as well as exhibit plentiful beauty in their self-structured relational patterns.*

Introduction:

Numbers that uniquely possess logically simple algebraic properties that pertain exclusively to themselves are discussed in this paper. The properties are expressible as simple logical equalities where a transformation of the number involved in a simple or common way results in a concurrent transformation of the same number by an alternate route, or in general a relationship of the number to itself that exhibits an increased self-reference when compared against other numbers.

Here is the list of numbers and their values, along with their defining properties which make them special found in the next section:

T = 1.8795…

L = 1.8393…

P = 1.813…

S = 1.7768…

D = 1.7549…

J = 1.7569…

I = 1.7286…

O = 1.7221…

o = 1.6938…

H = 1.678…

X = 1.6603…

Q = 1.63960…

E = 1.5652…

Z = 1.5549…

K = 1.5204…

N = 1.4966…

Y = 1.4656…

W = 1.4534…

F = 1.44138…

r = 1.4364…

f = 1.4343…

B = 1.38152…

A = 1.3660…

U = 1.3392…

M = 1.1975807343…

C = 1.2488…

G = 1.1993…

m = 1.19743…

R = 0.4759…

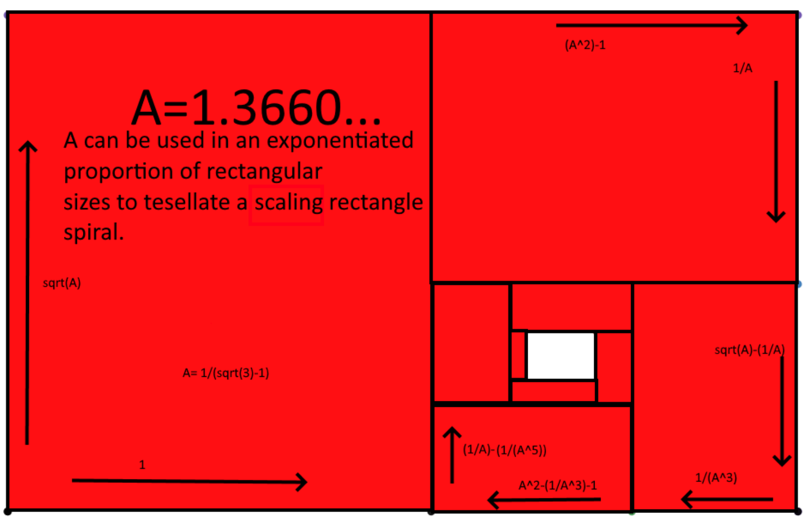
V = 0.4360…

n = 0.2324…

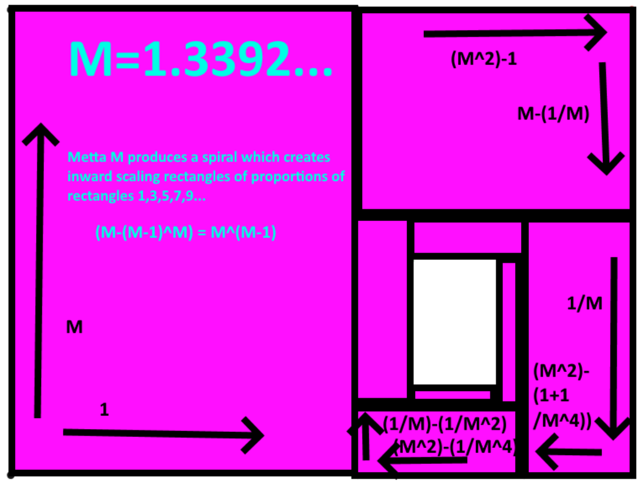
Findings:

These numbers discussed in this paper, referenced in the above section, have a variety of properties which are likely to help to formulate various mathematical equations in alternate ways. Their properties are of intense mathematical beauty in the opinion of your author.

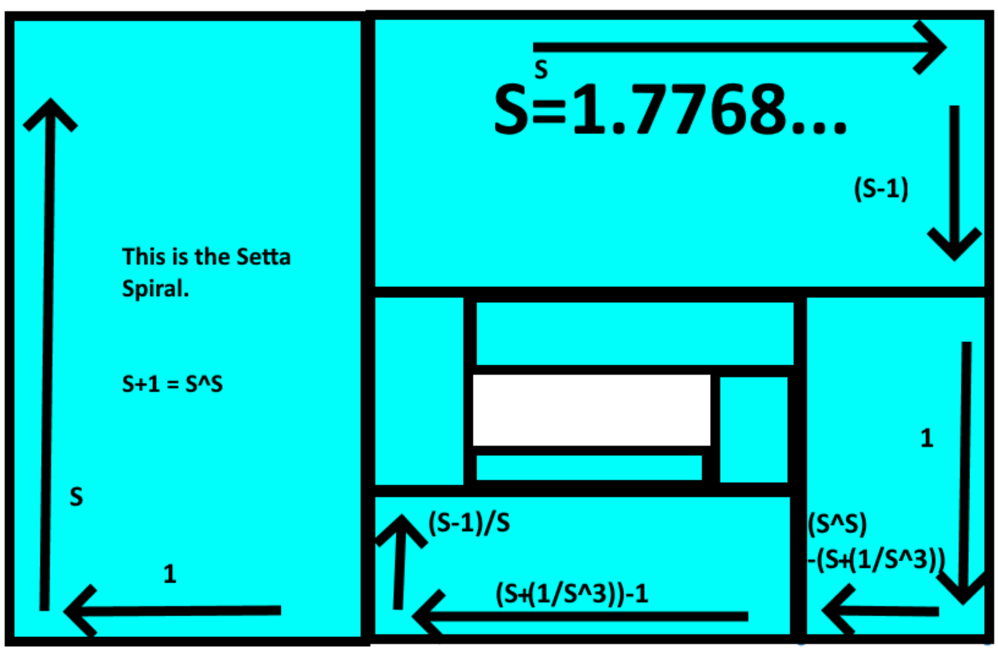
Noted, some of these identities have strange and potentially useful properties - and, despite being hard to calculate by hand, they have relations that make them easy to find and exact with just a calculator. In various numeric systems, it becomes easy to wonder if these numbers can have implementation in shortening long calculative processes through logical 'loopholes,' or substituting expressions with ones of their own archetype. They can also make perfect geometric patterns or hold a root in geometric problem solving. One good example is Atta A, a number that equals (1/(sqrt(3)-1)) and generates a perfect scaling rectangular tessellation:



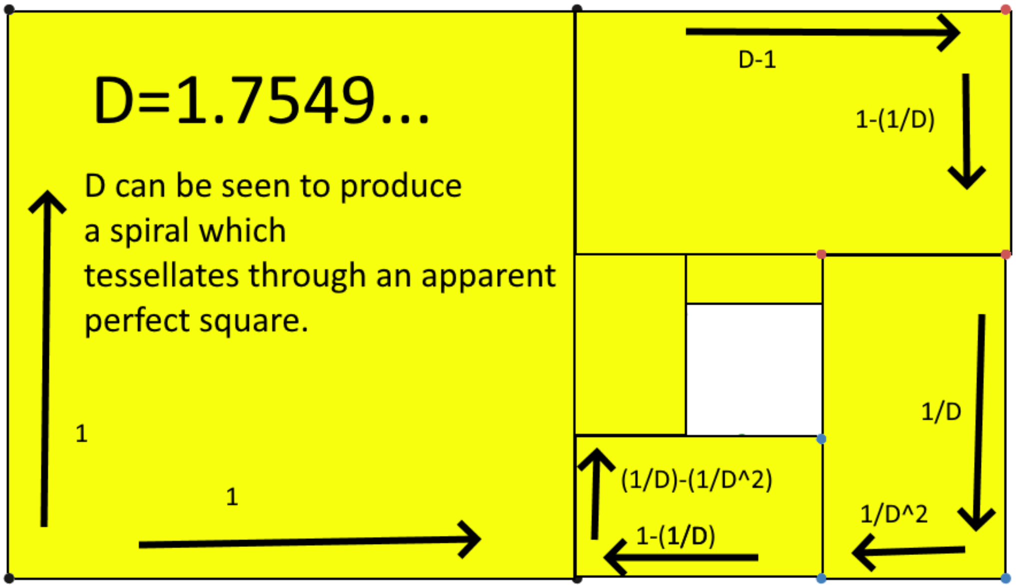
Another example is the spiral for Metta M, which spirals through a series of rectangles scaled by the first, third, fifth and so on rectangles:



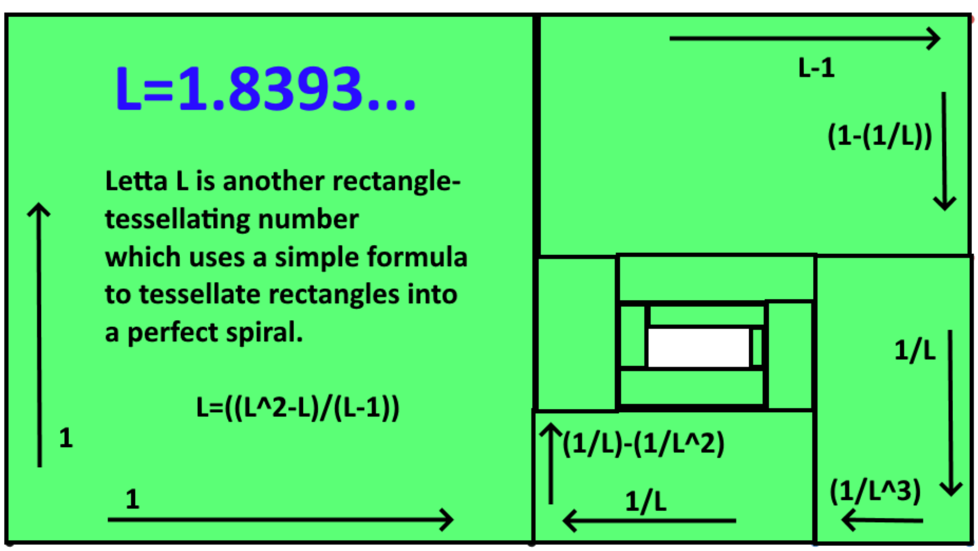
Another example is the spiral for Setta S, which spirals through a series of alternatedly arranged logical statements for its side lengths while maintaining a repeating order of vertices for rectangles in a tessellation:



Another example is the spiral for Detta D, a number with a plethora of properties, which spirals through a perfect square:



One more good example is Letta L, a number (not first discovered by the author, known collectively as the Tribonacci Constant) that, with its inverse is a root, or the zero-value of the equation of ((X^2-X)/(X-1))-X and generates yet another perfect scaling rectangular tessellation:



This paper will detail to you the values and properties of each of the respective numbers. They may be subject to be used in the calculation of natural progressions, processes, and geometrical relationships. These numbers may possess properties that can, much like words in a language, simplify modern mathematical operations used in conjunction, by offering substitutions and simplifications and alternate constant-based methods to express other forms of logical transformations of numbers. More effort is required in investigating into the functions of these numbers, but their general importance and reasons for consideration are evident in the properties of the numbers herein listed, expressing the properties which can simplify or substitute for mathematical transformations where they are harder to write into an equation:

The properties of the previously listed numbers will now be explained here:

Let number Meum M satisfy the equation:

With two other numbers as additional solutions:

$((M-1)*M + (M-1)*(1/M)) = (2^M)/(M^2) - M$

…so that, For any number n:

$((2^M)/(M^(N+1))) - M^(3-N) = (M-1)/(M^N)$

$((3^M)/(M^(N+1))) - M^(3-N) = (M-1)/(M^N) + 1/(M^(N-1))$

A few very closely calculated numbers that are within a ten thousandth or two of Meum hold:

$(M-1)^M + (M-1)^(1/M) = (2^M)/(M^2) - M$

$((2+4*M)/(4M-2))-M = (1+(M-1)*M)$

$(3+(3*(2*M-1)))/(3*M+3*(M-1)) = (M^3)$

Let number Etta E satisfy the equation:

$(1-(E-1))-(1/E) = E-(1/(E-1))$

Let number Atta A satisfy the equation:

$(A+1)/A = A+(A-1)$

$(1/A)-A = (1-(A-1)$

Let number Ketta K satisfy the equation:

$K^K = K+(K-1)^K$

Let number Utta U satisfy the equation:

$U-(U-1)^{U} = U^{(U-1)}$

Let number Wetta W satisfy the equation:

$1+(W-1)^{2} = \sqrt{W} = 1+((W-1)/(\sqrt{W}+1))$

Let number Zetta Z satisfy the equation:

$Z-(Z-1)^{2} = \sqrt{Z}$

Let number Fetta F satisfy the equation:

$F = (F+1)/(F^{F})$

Let number Yetta Y satisfy the equation:

$Y^{2} = 1/(Y-1)$

Let number Tetta T satisfy the equation:

$T^{T} = (T+1)/(T-1)$

Let number Metta m satisfy the equation:

$((m^{2})/2)+1 = m^{3}$

Let number Detta D satisfy the equation:

$(1/(D-1)) = 2*(D-1)$

$(1/(D-1))-1 = 1/D^{2}$

$(D-1)^{2} = 1/D$

$D^{2} = D+(1/(D-1))$

$D = (1/(D-1))^{2}$

$D+1 = D*(1+(D-1)^{2})$

Let number Itta I satisfy the equation:

$D+1 = D*(1+(D-1)^{2})$

Let number Cetta C satisfy the equation:

(1+(C-1)^2) = (C/(1+(C-1)^C))),

(1+(C-1)^C) = (C/(1+(C-1)^2)))

Let number Retta R satisfy the equation:

(R^R)/R = R+1

Let number Vetta V satisfy the equation:

V/(V^(V+1)) = V+1

Let number Rutta r satisfy the equation:

1/r = 1-(r-1)^r

Let number Hetta H satisfy the equation:

(2^H)/(H^2) + H = H^2

Let number Xetta X satisfy the equation:

(1/X) = 1-((X^(X-1))-1)

Let number Letta L satisfy the equation:

L^2 = (L+1)/(L-1)

Let number Getta G satisfy the equation:

((G-1)^G)/(G-1) = 1-((G-1)/((G-1)^(G-1)))

Let number Petta P satisfy the equation:

(P^(P-1)-(P-1))(1-(P-1))*P = sqrt(P)*

Let number Setta S satisfy the equation:

S+1 = S^S

Let number Jetta J satisfy the equation:

J^J = (J-1)^(1-(J-1))

Let number Otta O satisfy the equation:

O^O - (O-1)^(1/O) = O

Let number Outta o satisfy the equation:

o/(o-1) = o^o

(o^2/(o-1))-o^o = o

Let number Netta N satisfy the equation:

N^N – ((N-1)/N) = N

Let number Futta f and Nutta n satisfy the equation:

Both are roots of the equation:

(1/(1-(1-(1/X))))-(1-(X-1)) = (1+(1-(1/X))-(X-1))

They also relate by:

(1-(1/f))+1 = 1/(1-n)

(1/(1-n))-1 = 1-1/f

1/(1-(f-1)) = 1+(1/(1+(1-(1/f)))

Let number Quetta Q and Betta B satisfy the equations:

1-(B-(1/B))=(B^B)-1

B^B-(1-(B-1) = 1/B

Q^Q – 1/Q = Q

Other Numbers of Interest:

$$\left(\frac{\mathbf{x}}{\mathbf{x}-\mathbf{1}}\right)-\mathbf{x}^{\frac{\mathbf{1}}{\mathbf{x}}}=\mathbf{1}$$

This formula may pertain to its single root as a number whose property allows it to be able to be used to predict the complexity of closed systems which sustain with maximum efficiency, or the order of multiplicity which things can be measured most effectively. Moreover the value of the roots of this function may provide a view into the maximum complexity of an arrangement of things whereat the most complicated sample of possible things, such as another curvature shape or equation, is required to be used to fully explain the concept of such a thing. The value has not fully been calculated here, but the number this formula is rooted at, is so far 1.72… or so.

Another number of interest is equal to:

$$\boldsymbol{I} = \mathbf{134279985}$$

Because it is equal to an ideal and comfortable expansion of the values between two and three, the first two integer numbers to alter each other in a series of multiplication that are not identical, in consecutive iteration towards an increasing increase in value by mathematical operation:

$$2 * 3 + 2^{3+1} + 3^{2+1} + ((3+1)^{2+2} * (2+1)^{3+2}) + (2 * 3 + 2)^{(3*2+3)} \ldots$$

$$\ldots = \ I \ = \mathbf{134279985}.$$

I can be corresponded in its construction to a series expression with incrementing base values:

$$\sum_{\mathbf{n=0}}^{\infty} \frac{\mathbf{n}}{(\mathbf{n}+\mathbf{1}) * (\mathbf{n}+\mathbf{2}) + ((\mathbf{n}+\mathbf{1})^{(\mathbf{n}+\mathbf{3})} + (\mathbf{n}+\mathbf{2})^{(\mathbf{n}+\mathbf{2})}) + ((\mathbf{n}+\mathbf{2})^{(\mathbf{n}+\mathbf{4})} * (\mathbf{n}+\mathbf{3})^{(\mathbf{n}+\mathbf{3})}) + \left((\mathbf{n}+\mathbf{1}) * (\mathbf{n}+\mathbf{2}) + \mathbf{2}\right)^{\left((\mathbf{n}+\mathbf{1}) * (\mathbf{n}+\mathbf{2})+\mathbf{3}\right)}}$$

This value product of the previous series, with its inverse defined as L,

L is $= \mathbf{134279984.768}$.

And let K =134279984.884.. and is equal to the inverse of…

$$\sum_{n=1}^{\infty}\frac{1}{(n+1)*(n+2)+((n+1)^{(n+3)}+(n+2)^{(n+2)})+((n+2)^{(n+4)}*(n+3)^{(n+3)})+\left((n+1)*(n+2)+2\right)^{((n+1)*(n+2)+3)}}$$

While:

$$\frac{I-L}{I-K}=2$$

Astoundingly you can see that this number has a plethora of incredible properties.

So, you can say that number I and L and K share some astounding trends to do with their construction and the nature of their relevant expressions which terms itself in a way that is similar to how algebraic statements will begin to approximate towards true equality in numerous formulas as their extends towards infinity. An example is how the sum of inverses of a number to n power becomes closer to the inverse of that number minus one. Potentially this number I can be used to replace true infinity in certain calculation series in applied mathematics and etc.

Conflicts of interest, and data availability: *No conflicts of interest are relevant to this paper. Data availability is on the per request basis in contact with the author.*

References: *No references or sources on these numbers or the information on this paper were found, perused, or used, and the work done and the theory involved was developed wholly by the author using their own background of knowledge and calculative methods.*