Mathematical Color Theorem

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Preliminary Notions

Here the notion and idea is presented that: "Any dually monovalent function of repetitious nature is self enfolded in transcendent form by non-transcendent harmonic functions into separable forms of addition and multiplication as isomorphic due to self similarity of given interrelation to zero and any finite subset. As such as two parts to a given differential equation under $\pm$ and remainder with given terms of differential nature for addition and subtraction fold; it is also true that these parts under basic $\pm$ entitle the given of a chain of ∞ order of decomposition into linear expressions of equivalent nature and forms as that of an expression of the universal characteristic of mathematics in the physical world; by a given dimensionless."

Component Analysis

Analysis of these four graphs yields:

Any two nodes of a planar graph with adjacency are disconnected from any two nodes of the same graph for which are connected to any same node of the common graph.

In this; a node can connect or disconnect any two nodes of a graph they share.

Euler Characteristic

$$2 = \chi = V - E + F \tag{1}$$

Proof by Induction will be Required:
If $n = 1$ then...
If $n = n$ then $n = n + 1$.
With notion of $V = 2$, $E = 2$, $F = 2$.

$$V \to V + 1 \qquad V \to V - 1 \tag{2}$$

$$E \to E - 1 \qquad E \to E + 1 \tag{3}$$

$$\chi \to 2 + 2 = 4 \qquad \chi \to 2 - 2 = 0 \tag{4}$$

The right side can be ruled out.

Need color number.

$$\zeta = M(C) \tag{5}$$

Derived from graph polynomial.

Method:

Point off plane as perspectiveless limt; hidden color as from plane. Then able to handle ∞, & any finite number so by reduction.

Notion:

Must stick to plane; as this is the clearest setting for the problem before any considerations are made or formed.

Graph Polynomial:

$$\zeta = \alpha z^n + \beta z^{n-1} \ldots \gamma \tag{6}$$

prefactor : color index
z : placeholder for node identity
n : placeholder for node number

ζ by logic of $z^m - z^n = z^b$ as by logic of $z^m - x^n = y^n$ then; $m \geq\leq n(\pm 1)$ through powers by reverse side of $m \pm 1$ to all solutions for which FLT possesses no solution absolutely as all $z^m - x^n = y^n$ does absolutely.

$$\zeta = \alpha z^n + \beta z^{n-1} + \ldots + \gamma \tag{7}$$

z: placeholder for node
z^n : n: placeholder for node identity
α, β, γ placeholder for node color

Need institute coloring rules.

Then Consider:

$$\alpha z^m - \beta z^n = \gamma z^n \tag{8}$$

$$\alpha z^m - \beta x^n = \gamma y^n \qquad w/ \qquad \chi \tag{9}$$

The equation (1) here serves as a field over which (2) is reduced by the quotient. Meaning; under induction the quotient of (2) as a general graph is isomorphic to (2) under (1). As:

$$\chi = V - E + F \tag{10}$$

w/

$$\zeta = M(C) = \alpha z^n + \beta z^{n-1} + \ldots + \gamma \tag{11}$$

ζ constrained by the above therefore proof available as polynomial general & under reduction reduces to the specific case of four colors.

Make ζ complex for ± 1, $\pm i$.
Then 0 is the perspectiveless limit.
$m \pm 1$ in relation to n; also one displaced from $n = 3$.

$m \pm 1$ from $n \geq 3$ as in FLT as any general solution then, & $m \pm 1$ from n as in 1.) by which both polynomial FLT like solutions reduce to only four terms.

$$1.) \qquad \alpha z^m - \beta z^n = \gamma z^n \tag{12}$$

$$2.) \qquad \alpha z^m - \beta x^n = \gamma y^n \tag{13}$$

$$3.) \qquad 2\alpha z^m - (\beta + \gamma) z^n - \beta x^n - \gamma y^n = 0 \tag{14}$$

Run ζ through 1.) & 2.) to get: 2&2 terms by $\pm 1 \geq\leq$ through series w/ $mod m, n$ for which then there are four terms as in 3.).

$m = n$ the special case illustrates; the case of one node blind to all such nodes in the perspectiveless limit or as; no solution; or as (w/o $\alpha = \frac{1}{2}, \beta = \frac{1}{2}, \gamma = \frac{1}{2}$) as; the identification of two nodes. Then:

$$\zeta : (2\alpha - (\beta + \gamma)) z^m - \beta x^n - \gamma y^n = 0 \tag{15}$$

$$\zeta : \alpha z^n = \beta x^n + \gamma y^n \tag{16}$$

From which:

$$\zeta : \alpha z^n + \beta x^{n-1} + \delta y^{n-2} + \gamma = 0 \tag{17}$$

By induction has an infinite number of given solutions. (Natural repetition of argument.)

$$\zeta : 2\alpha z^m - (\beta + \gamma) z^n - \beta x^n - \gamma y^n = 0 \tag{18}$$

$m = n$ identification of two nodes w/ different colors and numbers entirely to same color and same identity (yet differing number).

identity : power : node 'color set'.
number : argument : node 'location'.

ζ reduces to $\zeta : \alpha z^n = \beta x^n + \gamma y^n$.

Then again to:

$$\zeta : \alpha z^n + \beta x^{n-1} + \delta y^{n-2} + \gamma \tag{19}$$

In z, x, y by FLT w/ duplicate.

In α, β, γ by generalized color polynomial.

In $n, n-1, n-2$ by $m \pm 1$ FLT w/o.

$$\zeta : \alpha z^n + \beta x^n + \gamma y^n = 0 \tag{20}$$

$$\zeta : \alpha z^n + \beta x^{n-1} + \delta y^{n-2} + \gamma = 0 \tag{21}$$

A : Need induction on n, for 2.).
B : Need proof w/o FLT, for 1.).

A.) To produce this proof by induction we need begin with B.) for which we begin with 1.) on the modular arithmetic; a proof by which ∞ solutions are illustrated to: $z^m - x^n = y^n$.
B.) Beginning here; there are a number of intermediary steps; one of which involves $m \geq\leq n$.

From which $z^m - x^n = y^n$ has an ∞ number of solutions ...
Then; $z^m - x^m = y^m$ has absolutely no solutions ...

Then $\alpha z^m - \beta x^n = \gamma y^n$ & $\alpha z^m - \beta x^m = \gamma y^m$ have an ∞ & absolutely no solutions, respectively, therefore $\{\alpha, \beta, \gamma\}$ are entirely arbitrary (mod m). Then let their addition be;

$$\zeta : \alpha z^m + \alpha z^n - 2\beta x^n - 2\gamma y^n = 0 \tag{22}$$

Then let $m = n$ to yield under redefinition of $\{\alpha, \beta, \gamma\}$.

$$\zeta : \alpha z^n + \beta x^n + \gamma y^n = 0 \tag{23}$$

Then as it holds by n that $\{\alpha, \beta, \gamma\}$ comparatively may grow with z^n & x^{n-1}, y^{n-2} we begin with:

$$\zeta : \alpha a^n + \beta b^{n-1} ... \gamma z^{n-2s} + \delta = 0 \tag{24}$$

as the polynomial of a general graph & ζ w/ $n = 1$ is on color; & one node; which functions yet we begin then w/ $n + 1$ by induction; on the argument of the prior proof.

$$\zeta : \alpha z^m + \alpha z^n - 2\beta x^n - 2\gamma y^n = 0 \tag{25}$$

$n = m - 1$.

$$\zeta : \alpha z^m + \alpha z^{m-1} - 2\beta x^{m-1} - 2\gamma y^{m-1} = 0 \tag{26}$$

$m = 2$ mod m:

$$\zeta : \alpha z^2 + \alpha z - 2\beta x - 2\gamma y = 0 \tag{27}$$

Making for a final equation:

$$\zeta : \alpha z^2 + \alpha z - 2\beta x - 2\gamma y = 0 \tag{28}$$

But; 1.) $\zeta : \alpha z^m + \alpha z^n - 2\beta x^n - 2\gamma y^n = 0$.
2.) $\zeta : \alpha z^n + \beta x^{n-1} + \gamma y^{n-2} + \delta = 0$.

ζ w/ $n = m - 1$ mod m w/ $n = m - 2 mod m$ w/ $n = m - 3 mod m$. Reduces trivially to:

$$\zeta : \alpha z^n + \beta x^{n-1} + \gamma y^{n-2} + \delta = 0 \tag{29}$$

By repeated addition of 1.) w/ the modular rules & 0.) for which there is no δ; & instead there is a δs^{n-3}.

Hypothesis:

$$\zeta : \alpha z^n + \beta z^{n-1} + \gamma z^{n-2} + \delta z^{n-3} = 0 \tag{30}$$

connected to:

$$\zeta : \alpha z^n + \beta x^{n-1} + \gamma y^{n-2} + \delta s^{n-3} = 0 \tag{31}$$

& reduces to:

$$\zeta : \alpha z^n + \beta x^{n-1} + \gamma y^{n-2} + \delta s^{n-3} = 0 \tag{32}$$

Backwards and forward induction from ∞ polynomial to 4th order polynomial by what in effect is the addition of nodes, lines, and faces to a graph. Re-expressed: The complexity of a planar graph never exceeds K_4. Thus: The graph is completely described by ζ.

Forms a complete relation if order of the polynomial continually diminishing yet we need two ways to express color graph polynomial as equivalent.

Required:

Deconstructive; Addition forces reduction.
Constructive; General inclusive of specific.

1.) ∞ ζ order of z is of one point of the same relation.
2.) Inductive step is a full relation of ζ order of i & ζ order of z dual elimination with above 1.)

Steps cover relation such that process of reduction simplifies yet hides coloring.
Reduction in terms accomplished by relation to fundamental polynomial.
The reduction and extrapolation to more complex sets of reducibility occurs by m, n in mod.

$z^m - z^n = l^n$ off relation:

$$1.) \qquad z^m - x^n = y^n \tag{33}$$

$$2.) \qquad \alpha z^m - \beta x^n = \gamma y^n \tag{34}$$

With 2.) the relation of the expression to that of the coloring polynomial to the graph is of $V \pm 1, E \pm 1$ in (vertices, edges) for in relation to $m \pm 1$ an open relation of αz^m eliminates to that of m as of one relation; a point, & $\alpha z^m - \beta x^n = \gamma y^n$possessing an ∞ of solutions & the process of reduction represent the entire graph outside this point This attributes the property of uniqueness to the graph coloring up to mod {} where {} is representative of any.

$\zeta : \alpha z^m - \beta x^n = \gamma y^n$ with two n the relation is overcomplete by one at each step; hence delimiting the graph by one complete relation in a given reduction to one clored graph of four given colors. However we must appeal to four relations as ∞ polynomial will not reduce unless uniqueness exists & is preserved; yet if we do; problem with two final steps of induction vanishes.

There are an ∞ of solutions to that of ζ so any & all reductions in ζ & χ are merited as by either relation the given of two n & two m (α, z) identify an ∞ process of reduction by two principles with two steps.

$$\zeta : \alpha z^m + \beta z^{m-1} + \gamma z^{m-2} + \ldots + \delta z = 0 \tag{35}$$

$\{\alpha, \beta\gamma\delta\} \equiv \{\pm i, \pm 1\}$ hypothetical.

$$\chi : \alpha z^m - \beta x^n = \gamma y^n \tag{36}$$

$$\zeta - \chi : \beta z^{m-1} + \gamma z^{m-2} - \beta x^n + \ldots + \delta z = \gamma y^n = 0 \tag{37}$$

$m - 1 = n$ then ± 1 on m & χ admits ∞ of solutions to χ for which $\zeta - \chi$ is a subset; then reduction in concordance with $m \pm 1$ grants an alternation of rules for ζ & χ, for which ζ reduced to $\zeta - \chi$ by association of subset & elimination of distinct identification.

Then setting $m - 1 = n_l$ reduces further for which ζ with n_l for $l = 0$ to ∞ eliminates next z^{m-2} as $z^{n_l - 1}$ until ∞ solutions found in z; & then operating with a new $\{x, y\}$ reduces 3 times as limits of FLT.

What this amounts to is an overarching method of two natures of reduction from two steps of induction into one relation by which a certain given singular step of one color under reflection through a node or vertex; which may act as a line or edge to isolate one interchangeably from having the same color as another one.

As for the characteristic polynomial & it's composite structure; four of each of the color, the location the index & the node number are reduced to one by the three ways out & one way in for which one limit is open to that of any of three ends.

$$\zeta : 3z^2 + 2z^3 + z + 2y^2 + 3y + x + s = 0 \tag{38}$$

$$\chi : 2z^m - x^n = 2y^n \qquad let \qquad m = 3 \tag{39}$$

$$\chi - \zeta : 3z^2 + z + x + x^n - 2y^n + 2y^2 + 3y + s = 0 \qquad let \qquad n = 2 \tag{40}$$

$$\zeta - \chi : 3z^2 + z + x - x^2 + 3y + s = 0 \tag{41}$$

$$\chi : 3z^m - x^n = 3y^n \qquad let \qquad n = 1, m = 2 \tag{42}$$

$$\zeta - \chi_1 - \chi_2 : z - x^2 + s = 0 \tag{43}$$

$$\chi : z^m - x^n = y^n \qquad let \qquad m = 1, n = 2 \tag{44}$$

$$\zeta - \chi_1 - \chi_2 - \chi_3 : s = y^2 \tag{45}$$

An equation for a disconnected circle.

These relations are an entire difference in one; of that of the equations ζ and χ for that of either given modular relation through that of which a given parallel formed from that of a third order relation in powers reduces to a given third order and third order parallel relation.

With that of either given two fold power relation; that of what is exemplified is a given choice function on C_2^3 among selections of incommensurate and exclusive relations of color's by power and variable of the given intermediate additional equation.

Rerelation to Prior Work

$$D : 1 + \frac{C_2^N C_{N-2}^N}{C_2^N + C_{N-2}^N} \tag{46}$$

C_2^N is the select $\{\alpha, n\}$ i.e.
C_{N-2}^N is the select $\{\alpha, n\}$ i.e.

for which ζ is a disconnected set or connected set under $\{\alpha, n\}$ i.e. or connected set under χ with $\{\alpha, n\}$ or disconnected set; exclusively, for that of relations of nodes for which polynomials overlap. In other words D : is the unique subset to set relation by which coloring is blind as the shared to unshared.

Either odd or even structures of polynomials as identifiable with coloring graphs are therefore stochastic in at least the measure of each of the finite reduction via complex groups to that of quartic positive negative structures of reduction via connectedness of topology for spaces in such as within which there is a single surface.

Finality

This extends to a theorem about the Euler characteristic; to that of what excepts the difference of a volume and a surface; to that of counting; the additional one; to which reduction of one for then in the other outweighs that of the difference; to know there is a support to which in it's established given means the mentative of a difference in either; of the physical and the mental; of the mentation on which is the support of mind; a fundamental through which we learn of that of knowledge.

"The lightness condition of which is to the greater of it's leverage in count; differs to that of volume as in that of dimension by one."

Formative Conclusion at ∗ New Approach

That of the Jordan Curve Theorem with the Brouwer Fixed Point Theorem, instruct(s) then of higher dimension(s) of two points off a plane, and for lower-dimension, one-point, of what is a graph coloring theorem, for that of four, to ’section’s’ of quadrature. That of the ’plane’ is a ’line’ to-which when drawn over that of ’point(s)’ intersect(s) and cleaves in-half, or remain(s) of wholeness and balanced upon-two. In the representation of guilt for innocence, this remains validly exclusive, to that of - also - that of a line (half filled circle) as drawn from ’horizon’ to ’horizon’, for in innocence. That of guilt remains for that of either of the prior 3/4 or three-quarter(s). Thus, the binary (and there is no more but of a boundary on an infinite pathological plane graph) - division remains of the (2x2) nature, that therefore four color(s) suffice.

Further inquiry leads to a solution to the Riemann-Zeta hypothesis in relationship to the Goldbach Conjecture, for of general Dykin Diagram(s) in Lie group theory.