An elementary study of the roots and exponents; and a Computer Based Math mechanical contrivance to construct spatial shape of roots of counting integer displacement radii on the rotating accreting plane in occupied space of a central force field.

ALΣXANDΣR; CEO SAND BOX GEOMETRY LLC

If we want to learn how to construct mechanical energy curves of central force fields, it is necessary to learn the physical shaping phenomena of exponents in square space and curved space.

Constructing Roots on a Central Force Magnitude

April 7
2019

Gauss's fundamental theorem of algebra, simply stated, declares that a polynomial when zeroed out, will have a number of solutions determined by highest degree exponent. I construct a parametric geometry abscissa definition for 1st Quadrant root(s) of a specific central force magnitude. Then I provide two curved space solution curves to intercept square space computer abscissa definition of roots. The first place I need visit, as a starting comparative of square space math with curved space math discovery of Computer Based Parametric Geometry construction of roots of a Central Force Magnitude; has to be exponents and how they shape the space curves we live with.

Curves and lines of numbers and the shape of exponents and inversed exponents (roots)

Index

Monograph 40 pages, 6000 words with *Mathematica* and GeoGebra.

INTENTIONS

I have been working with methods to construct G-field mechanical energy curves for 25 years.

I feel the only way to, analyze, construct, and see changing mechanical energy of the G-field is with Computer Based Geometry. Specifically, computer based parametric geometry using curves.

What better way to study curved space then with curves?

I invented a Curved Space Division Assembly (CSDA) so I could use curves to study curved space mechanical phenomena.

I found methods, using the same computer mechanical tool, to construct roots.

Constructing roots using curves is enlightening. I use the index (a) as a parametric exponent to construct solution curves for designated root of (b). $\left(\sqrt[a]{b}\right)$.

There will be two solution curves for (a^{th}) root radicand (b). $\left\{t, \frac{t^a}{\mp 2} \pm \frac{b}{2}\right\}$.

A **CSDA** is a central relative machine. Being so, I can study the two infinities composing our being. Parametric Central Relativity view of this composition Creation is a two-way street. On one end point of this linear vision into space of our being is curvature. The other end point must be radius of that curvature. Micro space infinity is the realm of curvature, and macro space infinity meters radius of that curvature. I believe this to be the sight line connecting Creation with the human mind.

It is not a far step to change a Cartesian Coordinate System into a spinning platform to analyze central force natural space curve congruent gconnection with the square space math of the last 500 years. We can do so thanks to ancient Greek Geometry and acquired math essence of the past 500 years. Add to this mix 21st century technology of computer-generated dynamic parametric geometry and we are good to go.

CURVED SPACE DIVISION ASSEMBLY; TWO BASIC CURVES (**CSDA**©)

What better way to study curved space then with curves?

There are only two curves in Plane Geometry tool chest that have loci obedient to one center that I know of.

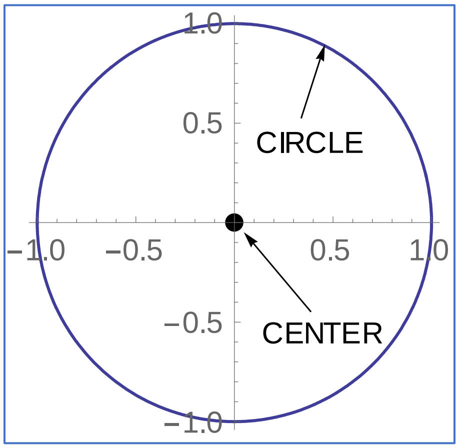


Figure 1: the unit circle

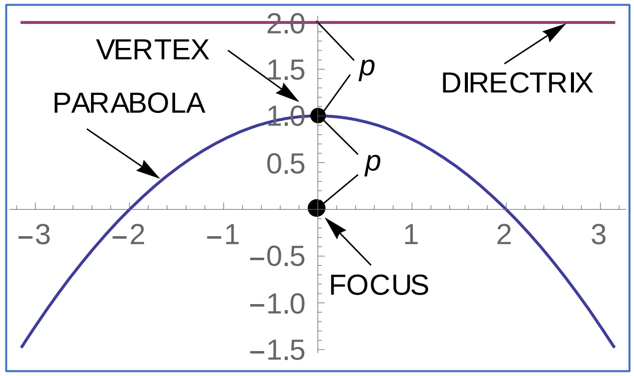


Figure 2: the unit parabola

- The Circle. We already know a circle and its center.
- The Parabola and its focus. This curves locus has obedience split between a directrix and its focus.

What is interesting about a parabola curve is how a center point becomes a focus. A unit Parabola focal radius is not constant as a circles radius is, but changes meter as it traces the locus of the curve. What is constant in a parabola, is the properties exhibited between the focus, vertex, and directrix. I use the number (*p*) to demonstrate this fact. The line from the focus to the curve's vertex is the *initial* focal radius and is 1 unit in length, therefore (*p* = 1) in the Unit Parabola Construction (only). The bigger the curve, the bigger will be (p). The magnitude of dependent curve initial (*p*) grows proportionality with the independent curve circle (r).

Significant parts of a parabola are:

- initial focal radius (*p*, focus to vertex) and
- Latus Rectum Chord-Diameter (4*p*).

Important! $(r = p)$; always. When studying 3-dimensional space, this adage becomes $\left(dependent\ initial\ focal\ r = independent\ \frac{\pi}{2} spin\ r\right)$.

Geography of a **Curved Space Division Assembly (CSDA)**

$$\text{ParametricPlot}[\{\{\text{Cos}[t], \text{Sin}[t]\}, \{t, \frac{t^2}{-4(1)} + 1\}\}, \{t, -\pi, \pi\},$$
$$\text{PlotRange} \to \{\{-3,3\}, \{\frac{-3}{2}, \frac{3}{2}\}\}]$$

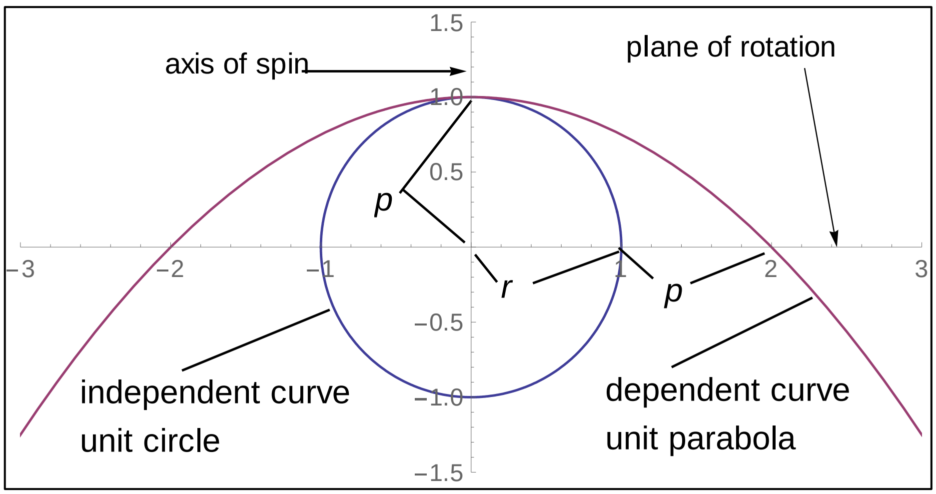


Figure 1: basic CSDA. Most important proportion is (π/2) spin radius (r) and initial focal radius (p); (r = p)

This construction is a basic parametric geometry **CSDA.** It is the standard model I use to determine roots of linear magnitudes. A **CSDA** spins. A freeze frame of **CSDA** spin is always congruent with any other freeze frame spin selection.

CSDA curved space geometry uses calculus function hierarchy to establish a parametric geometry function allowing the **CSDA** system utility of two parametric curves. The discovery curve of central force control phenomena will be the independent curve. The dependent definition curve meters changing space-time phenomena under control of central force **F**.

All my roots of magnitude constructions begin with Euclid's perpendicular divisor.

PowerPoint Informative (parametric upgrade for EUCLID'S ⊥ divisor). 2013 MATHFEST, HARTFORD CONNECTICUT

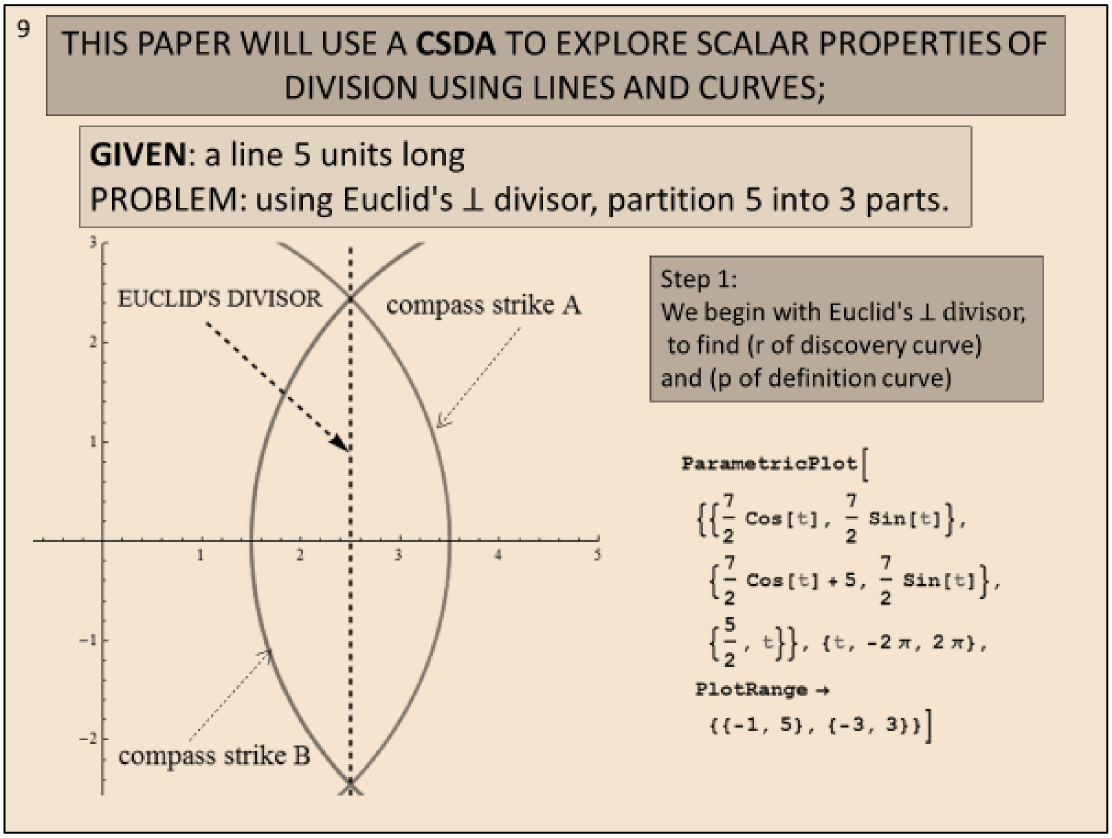


Figure 2; utility of Euclid's Perpendicular Divisor: Step 1; set a compass greater than half considered magnitude. Step 2; set compass point on magnitude ends and strike arc (A) and (B). Step 3; use straight edge connection of arc intercepts to find midpoint of any magnitude.

Once mid-point (r) is known, I have my independent discovery curve radius .We can now use computer based parametric geometry to construct $(\sqrt{2})$. After which I will post methods to construct roots of any magnitude.

I use basic computer technology to find and mark the place in/on the space defined by our number magnitude with its indexed root abscissa ID; then construct curved space intercept confirming agreement between square space math (abscissa ID of a root) and curved space math root solution curves.

Sand Box Geometry construction $(\sqrt[2]{2})$ or $\left(2^{\frac{1}{2}}\right)$.

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{\sqrt{2},t\},\{t,\frac{t^2}{-2}+\frac{2}{2}\},\{t,\frac{t^2}{+2}-\frac{2}{2}\}\},\{t,-\pi,\pi\},\text{PlotRange}\to\{\{-3,3\},\{\frac{-3}{2},\frac{3}{2}\}\}]$$

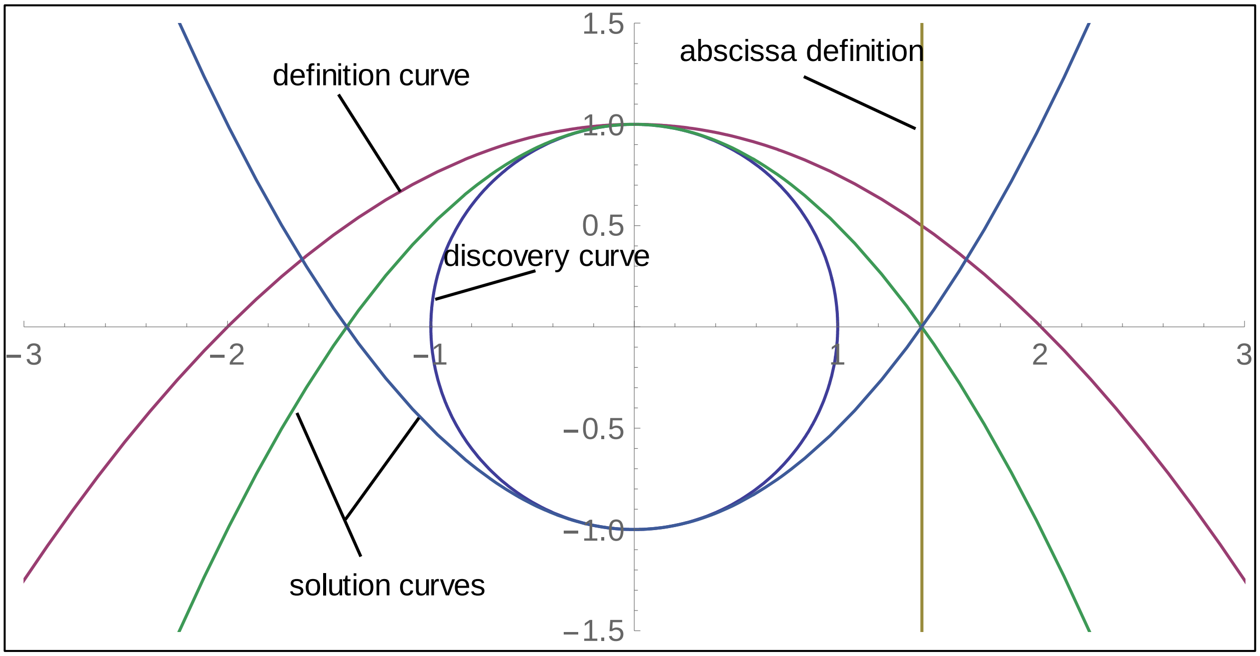


Figure 3: Curved Space Construction for $\sqrt{2}$. Abscissa definition is $\sqrt{2}$. Both solution curves intercept $\sqrt{2}$.

I call the unit circle and unit parabola a unit moniker because the curves are constructed using a pre-determined unit of square space: (Euclid's magnitude/2).

Curved space construction of $(\sqrt[4]{2})$; to see the changing shape of even indices solution curves.

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{\sqrt[4]{2},t\},\{t,\frac{t^4}{-2}+\frac{2}{2}\},\{t,\frac{t^4}{+2}-\frac{2}{2}\}\},\{t,-\pi,\pi\},\text{PlotRange}\to\{\{-3,3\},\{\frac{-3}{2},\frac{3}{2}\}\}]$$

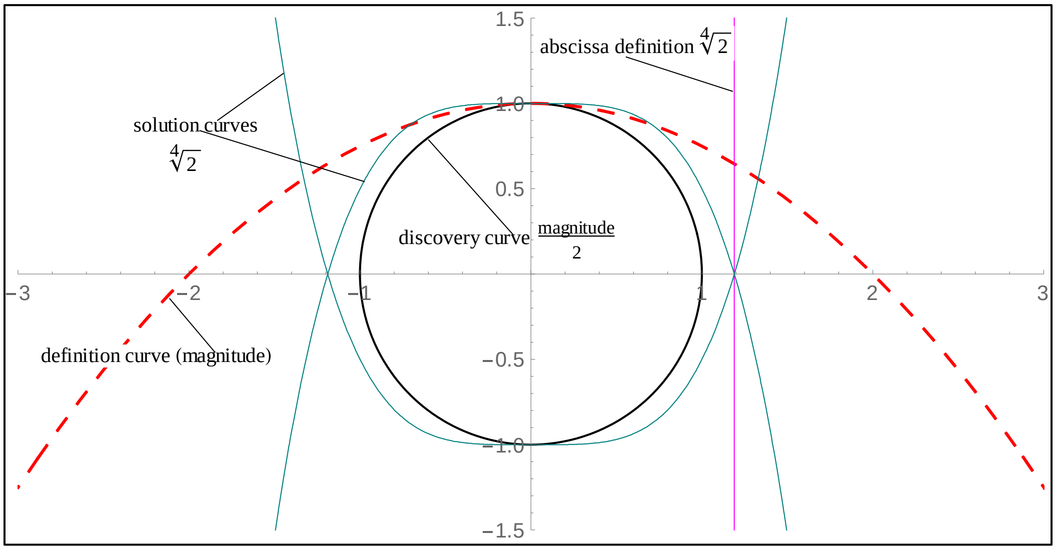


Figure 4: Curved Space Construction for $\sqrt[4]{2}$.

We see that ***even*** indices solution curves are a parabolic shape and flatline $(m = 0)$ slope at N a S poles of a central force spinning field.

These are the methods to construct root of magnitude.

- Divide the considered magnitude by (2; using Euclid's ⊥ divisor) to find the discovery radius of curved space. With the discovery radius construct a dependent parabola definition curve for square space magnitude.
- Independent (DISCOVERY) curve parametric description: $\left(\frac{magnitude}{2} Cos\ [t], \frac{magnitude}{2}\ Sin[t]\right)$.
- Dependent (DEFINITION) curve parametric description: $\left(t, \frac{t^2}{-4(p)} + r\right)$, where ($p$) = ($r$: $\frac{magnitude}{2}$) of discovery circle.
- Solution curves for roots of magnitude:

$$\{t, \left(t^{desiredrootindices}/\mp 2\right) \pm (magnitude/2)\}$$

Curved space construction of$\left(\sqrt[3]{8}\right)$; to see the changing shape of solution curves

$$\text{ParametricPlot}[\{\{\frac{8}{2}\text{Cos}[t],\frac{8}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{8}{2}\right)}+\frac{8}{2}\},\{t,\frac{t^3}{-2}+\frac{8}{2}\},$$
$$\{t,\frac{t^3}{+2}-\frac{8}{2}\},\{\sqrt[3]{8},t\}\},\{t,-3\pi,3\pi\},\text{PlotRange}\to\{\{-4,9\},\{-6,6\}\},$$

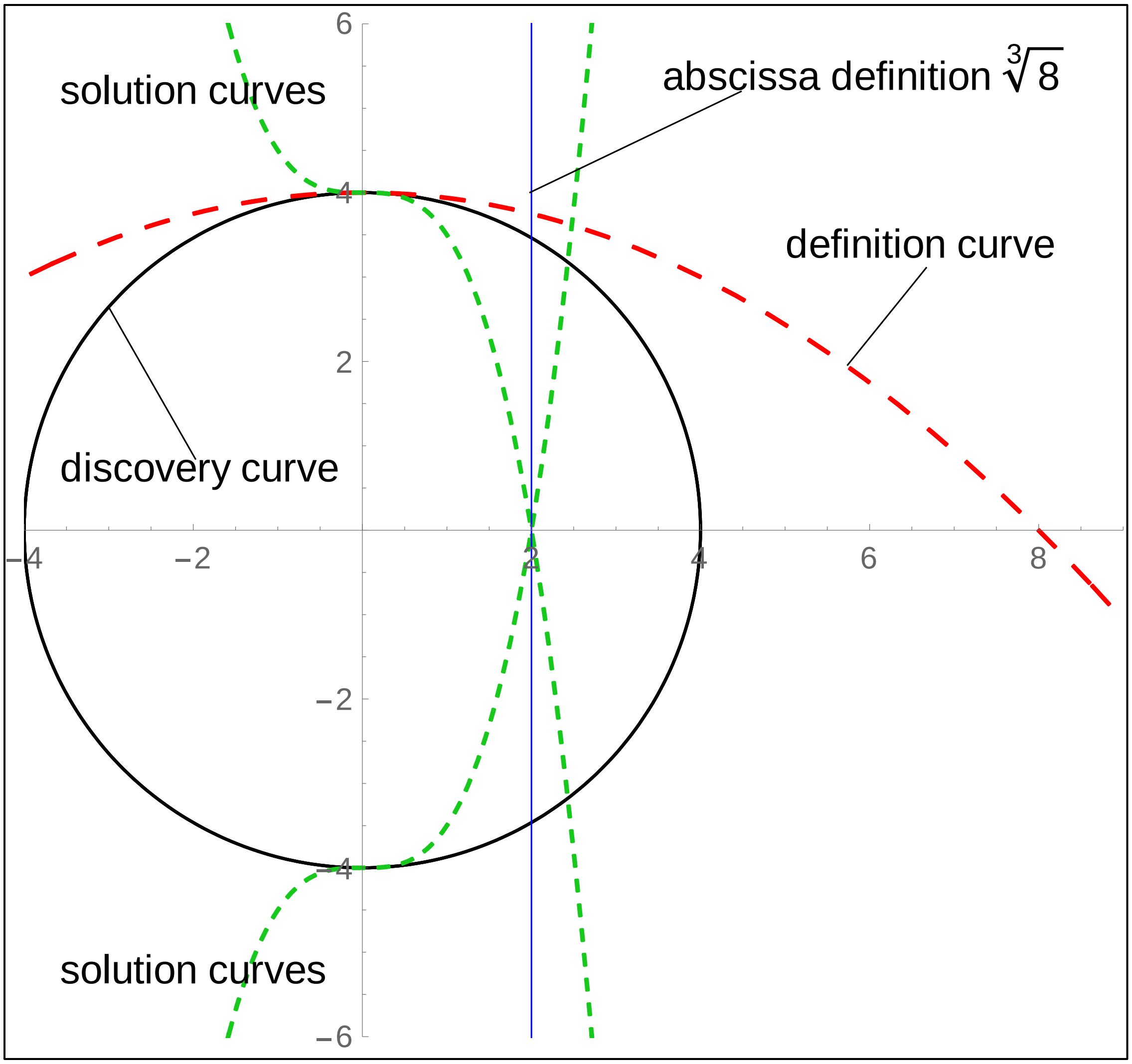


Figure 5: Curved Space Construction for $\sqrt[3]{8}$.

Curved space construction of $\left(\sqrt[5]{3}\right)$*;* to see the changing shape of odd indices solution curves.

$$\text{ParametricPlot}[\{\{\tfrac{3}{2}\text{Cos}[t], \tfrac{3}{2}\text{Sin}[t]\}, \{t, \frac{t^2}{-4\left(\frac{3}{2}\right)} + \frac{3}{2}\}, \{t, \frac{t^5}{-2} + \frac{3}{2}\}, \left\{t, \frac{t^5}{+2} - \frac{3}{2}\right\},$$
$$\{\sqrt[5]{3}, t\}\}, \{t, -3\pi, 3\pi\}, \text{PlotRange} \rightarrow \{\{-4,4\},\{-2,2\}\}, \text{AxesOrigin}{-}{>}\ \{0,0\}]$$

Note: all solution curves (even and odd) always find independent $\left(\frac{\pi}{2};\ 90°; N\ spin\right)$ & $\left(\frac{3\pi}{2}; 270°; S\ spin\right)$ spin vertices of **CSDA** parametric geometric spinning central force field construction with flatline (zero slope). Square space math zero's a polynomial to find solution number of roots (Gauss), curved space math zeroes slope to find solution root. The spin diameter (radian meter) of a **CSDA** sphere are vertices N & S. N is (π/2), and S is $\left(\frac{3\pi}{2}\right)$. Rotation diameter end points also have definition. Rotation diameter of a **CSDA** is found on the dependent parabola chord normal with and intersecting the spin axis of **F** at **F**. Its parametric geometry name is the system Latus Rectum parabola chord with ends E & W. W is (π; 180°) and E is (0°or 2π; 360°). This chord become the G-field central force accretion diameter extending control phenomena of **F** into square space macro infinity.

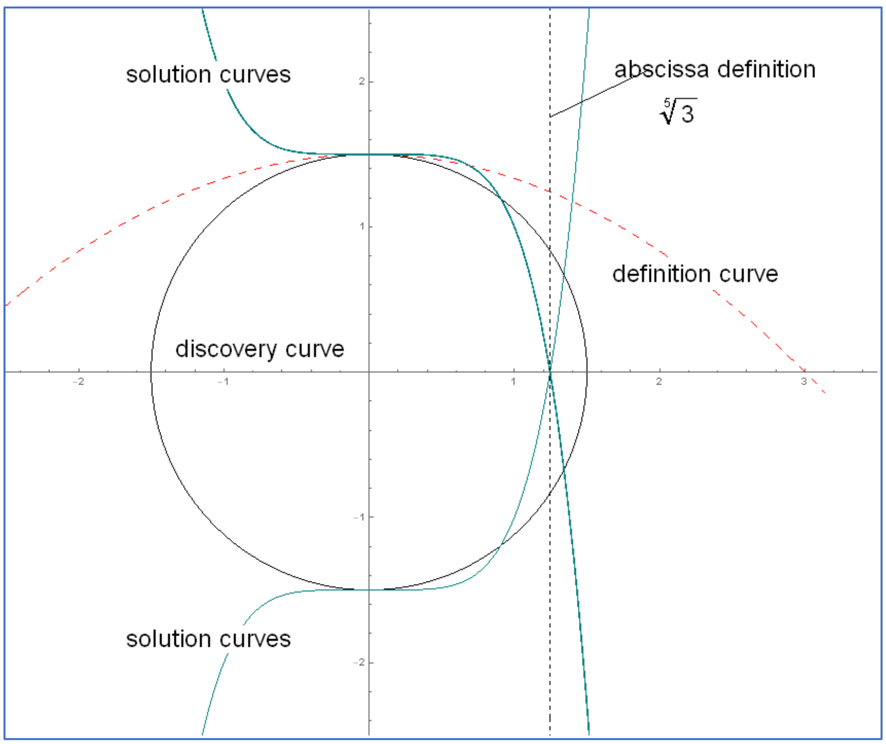


Figure 6: Curved Space Construction for $\sqrt[5]{3}$.

These four radian angles are the only radian description used by the Sandbox.

<u>*Spin*</u>: N: (π/2 = 90°); S: $\left(\frac{3\pi}{2} = 270°\right)$. <u>*Rotation*</u>: W: (π = 180°); E: (0°or 2π; 360°).

EVEN INDICES $\sqrt[4]{2}$

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{\sqrt[4]{2},t\},\{-\sqrt[4]{2},t\},\{t,\frac{t^4}{-2}+\frac{2}{2}\},\{t,\frac{t^4}{+2}-\frac{2}{2}\}\},\{t,-\pi,\pi\},\text{PlotRange}\rightarrow\{\{-3,3\},\{\frac{-3}{2},\frac{3}{2}\}\}]$$

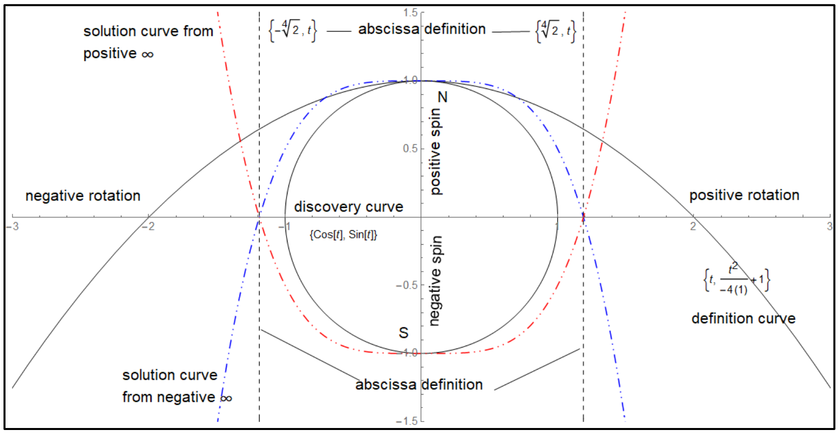


Figure 7: **CSDA** curved space construction of even indices $(\sqrt[4]{2})$ 4th root of magnitude (2).

Even indices seem to favor two root abscissa ID. One on negative side of discovery curve spin and one on the positive side of discovery spin.

ODD INDICES: seem to favor one root abscissa ID on the positive side of discovery spin.

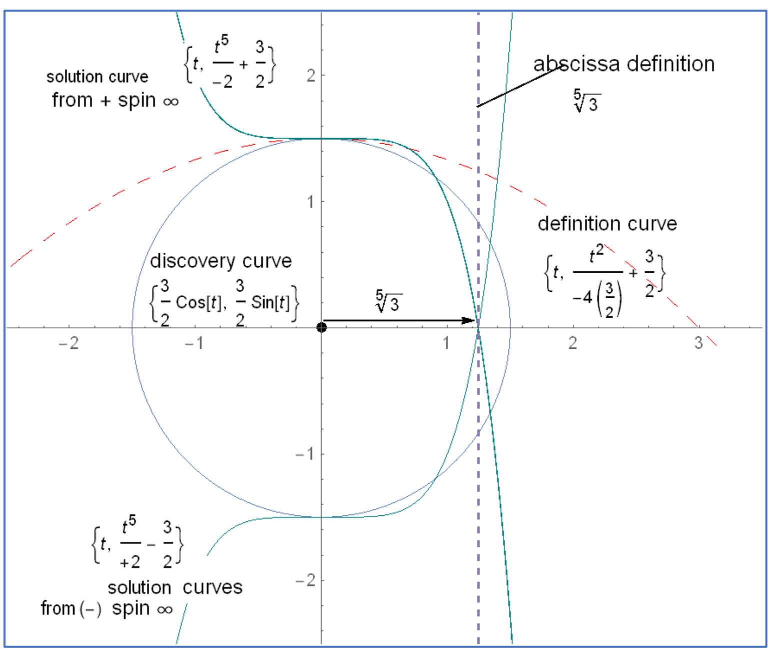


Figure 8: **CSDA** construction defining shape of odd indices $(\sqrt[5]{3})$.

on signing CSDA spin-rotation space:

Positive (+y) is positive side of rotation.
Negative (—y) is negative side of rotation.
Negative (—x) is negative side of spin.

Positive (+x) is positive side of spin.

When analyzing spin/rotation direction/*position* vectors produced by central force control phenomena of **F**; we use freeze frame technology. All freeze frames of spinning **CSDA** central force fields maintain physical geometric cloned (congruent) properties of **F**.

PART 2: LINES of CURVED SPACE and SQUARE SPACE and philosophy of CURVED SPACE CENTER of CURVATURE and RADIUS of CURVATURE

The first line was a Euclidean definition, uniquely defined by two endpoints.

A $\longleftrightarrow$ B (shortest distance between two points).

A Euclidean line has no width, has meter of length only: $\overleftrightarrow{AB}$

A **CSDA** curved space line also has two endpoints. Curvature and radius of that curvature, two endpoints presenting two *viewpoints* residing opposite each other, positioned from, across, and separated by two infinities. Radius, a conceptual length we can hold and measure populates macro infinite square space. Curvature, the inverse of radius, is a number only and has ethereal residence confined to curved space micro infinity. Curvature evaluation does carry a physical mathematical assignment. Center of Curvature, a square space anchor, a physical endpoint, a reach across our dual infinity existance, finding a co-anchor when discovering radius of curvature in countless imagined curves of square space.

I refer to a Connecting Principal to find Center of Curvature endpoints to construct a radius of curvature, and voila, magnitudes!

Center of Curvature and radii of curvature are linear endpoints in a unit *relative* curved space. By unit relative I mean $\left(independent\ \left(\frac{\pi}{2}\right)\ spin = dependent\ (p) \right)$.

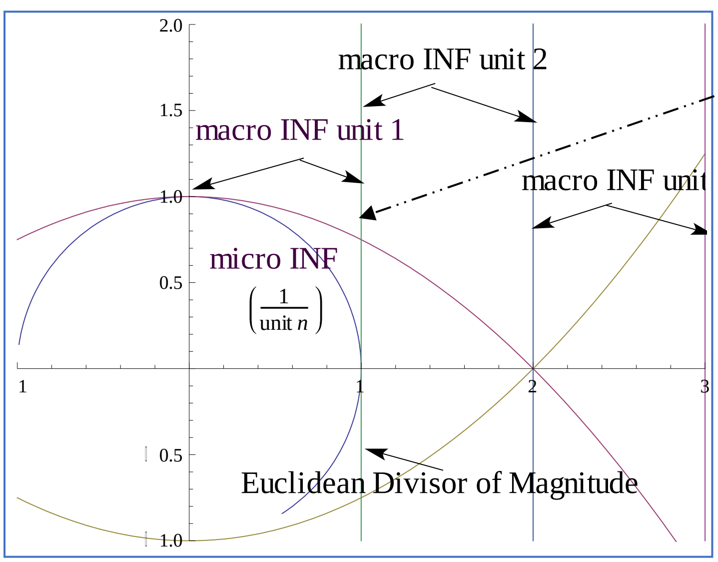
Euclid's line, when defining radii, begins with center (0) as origin of square space. Center of curvature and radius of curvature endpoints, as *curved space* definition of a circles linear connection, are not the same when considering dimensional analytics of space-time continuum as a square space (r).

Square space	Circle radius unit meter	Curvature evaluation	Centering radius of curvature (CoC)	Radius of curvature	Linear length radii square space	Linear length curved space
	2	1/2	Origin	2	2units	
	3	1/3	Origin	3	3units	
	1/3	3	Origin	1/3	1/3unit	

Curved space	Circle radius unit meter	Curvature evaluation	Center of curvature (CoC)	Radius of curvature	Linear length CSDA square space radii	Linear length CSDA curved space (r)
	2	1/2	1/2	2	$(2 - F = 2)$ F is origin (0, 0)	$\left(\frac{3}{2}\right)$unit
	3	1/3	1/3	3	$(3 - F = 3)$ F is origin (0, 0)	$\left(\frac{8}{3}\right)$unit

PROPRTIES OF CURVED SPACE DIVISION ASSEMBLY (CSDA©):

Principal of linear radii and curvature relativity. For any radius of curvature (r) produced in the macro infinity there can exist one and only one inverse representation of this radius as curvature in the micro infinity. Micro infinity evaluation of curvature and radius will be $[(1/r)^{-1} = r]$.



Euclid's divisor splits magnitude into two parts finding a unit circle radius for division of magnitude space with a **CSDA©**.

Micro infinity holds the set of all inverse integers from micro-infinity center *to* unit circle circumference defined with Euclid's divisor.

Figure 9: Euclid's divisor determines unit meter 'one' of a **CSDA** number line.

Macro infinity holds the set of all integer meter of radii, from unit circle circumference and beyond.

From 2013 MATHFEST, HARTFORD CONNECTICUT

CONNECTING PRINCIPAL BETWEEN CURVED SPACE AND SQUARE SPACE:

For any radius of curvature (r) produced in the macro infinity there can exist one and only one inverse representation of this radius as curvature in the micro infinity.

Micro infinity evaluation of curvature and radius will be $[(1/r)^{-1} = r]$.

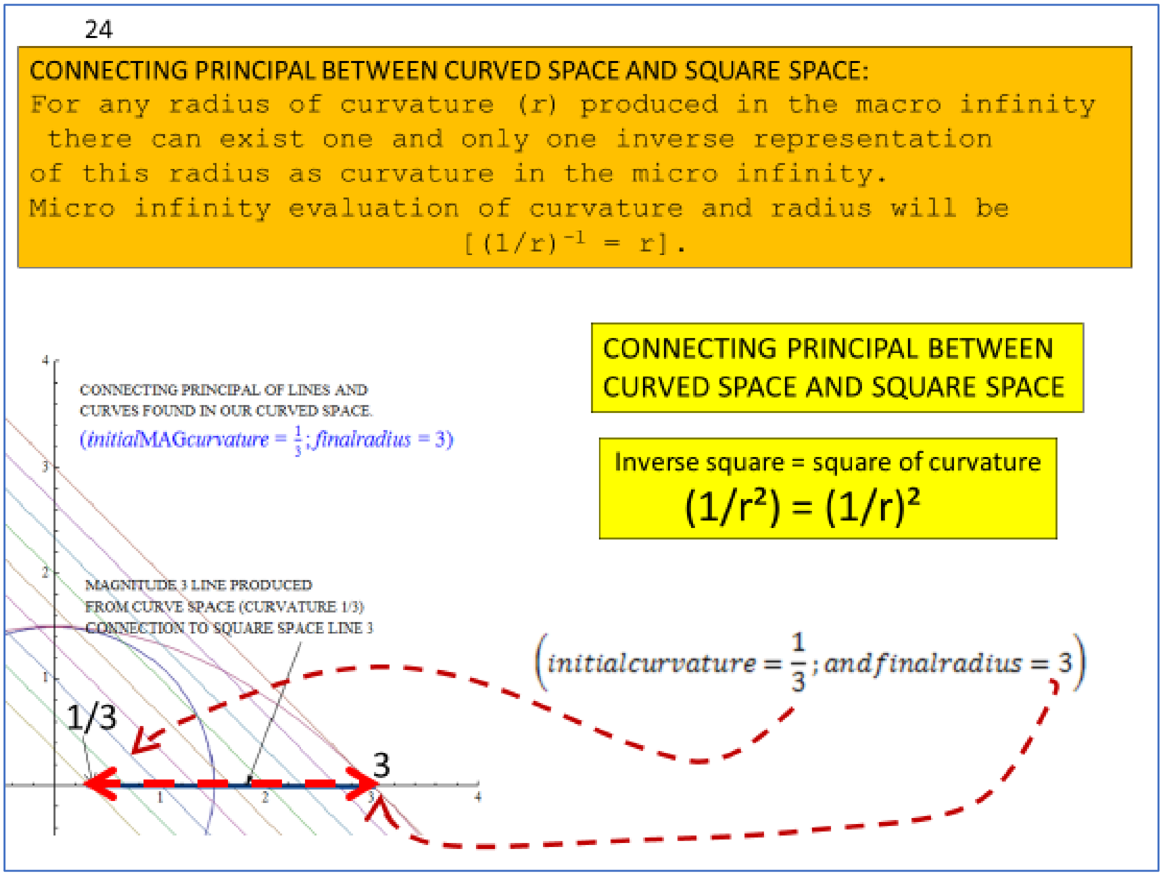


Figure 10: when a line 3 units long is divided into thirds, using Euclidean ⊥ division, we have an ‘inverse’ of multiplication. A series of nine division diagonals producing a nine-unit space square. It is with this square I construct a central relative curved space centering function for **F** using two Euclidean curves. A circle and a parabola to read curvature and radius of curvature connection principal; to meter square space using curves by creating a linear view connecting micro (curvature) and macro (radius) infinities.

CSDA curved space analytic construction of curvature and radii of space curves having roots born of even integer indices. $(\sqrt[8]{7})$ radius view; looking from micro infinity out to macro infinity endpoint.

The first line was a Euclidean definition, uniquely defined by two endpoints.

A $\longleftrightarrow$ B (shortest distance between two points).

A Euclidean line has no width, has meter of length only: $\overleftrightarrow{AB}$

A **CSDA** curved space line also has two endpoints. Curvature and radius of that curvature, two endpoints presenting two *viewpoints* residing opposite each other, positioned from, across, and separated by two infinities. Radius, a conceptual length we can hold and measure populates macro infinite square space. Curvature, the inverse of radius, is a number only and has residence confined to curved space micro infinity. Curvature evaluation does carry a mathematical assignment. Center of Curvature, a square space anchor, a physical endpoint, a reach across our dual infinity existance, finding a co-anchor when discovering radius of curvature in countless imagined curves of square space.

The following two constructions are about micro infinity curvature (κ) of central force space curves, macro infinity radii (r) in curved space, with central force **F** holding system position as Center of Curvature (CoC).

$$\text{ParametricPlot}[\{\{\tfrac{7}{2}\text{Cos}[t], \tfrac{7}{2}\text{Sin}[t]\}, \{t, \frac{t^2}{-4\left(\frac{7}{2}\right)} + \frac{7}{2}\}, \{t, (\frac{t^8}{-2} + \frac{7}{2})\}, \{t, (\frac{t^8}{+2} - \frac{7}{2})\},$$
$$\{\sqrt[8]{7}, t\}, \{-\sqrt[8]{7}, t\}\}, \{t, -8, 8\}, \text{PlotRange} -> \{\{-7, 7\}, \{-4, 4\}\}, \text{AxesOrigin} -> \{0, 0\}]$$

North main body root solution curve is negative (red) because I coordinate signing the N $\left(\frac{\pi}{2}\right)$ spin vertex of the dependent definition curve with 1st quadrant energy tangent event slope $(m = -1)$ happening at magnitude +7 on system latus rectum. By convention, let solution curves direction of approach to spin vertices

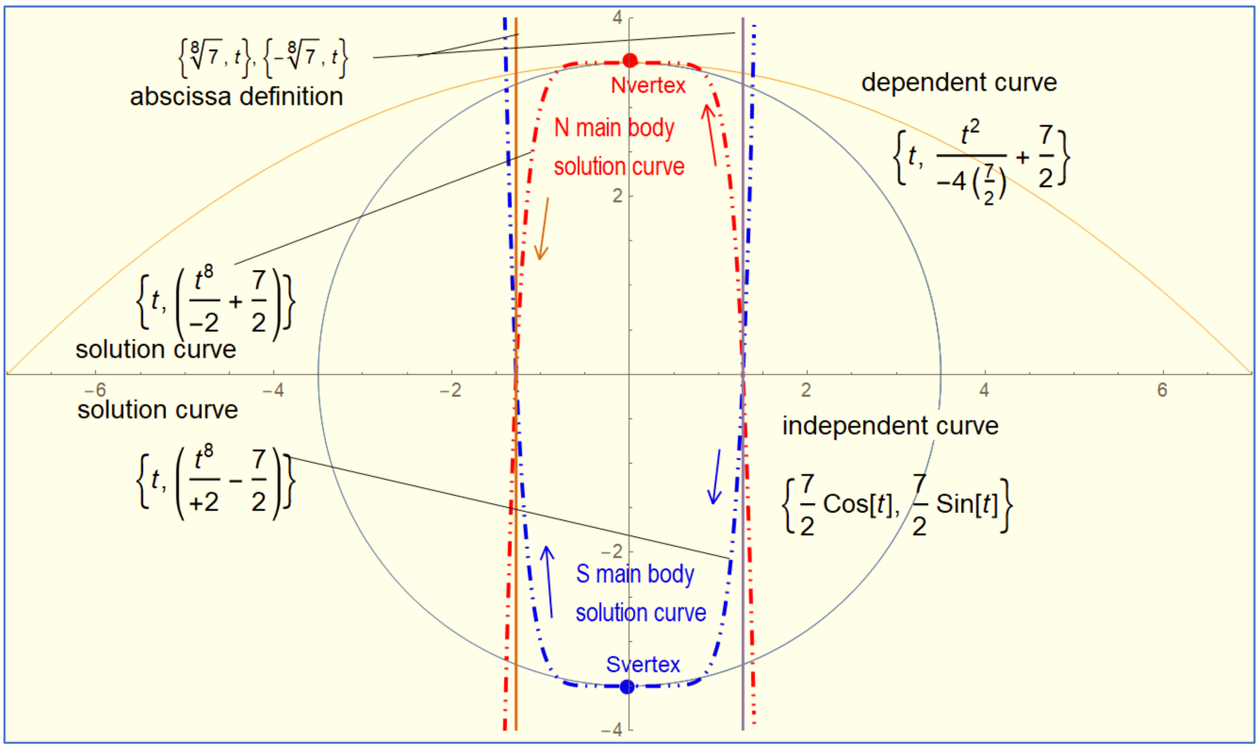


Figure 11: this view is from central force assemblage of endpoint root solution (curvature) produced by macro infinity endpoint definition (radius).

be across the rotation plane and toward positive side of system spin vertices.

Southern vertex main body root solution curve is positive (blue). Let energy tangent of dependent definition curve have slope $(m = +1)$ be a 4th quadrant happening at magnitude +7 on system latus rectum (definition curve $\left(\frac{t^2}{+4(p)} - r\right)$. By convention, let solution curves direction of approach to spin vertices be across the rotation plane and toward positive side of spin vertices. Let signing of solution curves carry sign of e-tangent slope event (± 1) at positive latus rectum definition of magnitude happening @ 1st & 4th quadrant dependent curves $\left(\frac{t^2}{\mp 4(p)} \pm r\right)$.

Inversing a curvature assemblage for definition radius view of macro radii endpoint into micro infinity central force curvature construction.

When dependent part of even indices solution curves become inversed $\{t, \left(\frac{t^8}{-2} + \frac{7}{2}\right)^{-1}\}, \{t, \left(\frac{t^8}{+2} - \frac{7}{2}\right)^{-1}\}$, solution curves suffer shape change; going *from* endpoint view (micro CoC κ) out to endpoint $(r\ in\ macro\ \infty\ space\ )$ along the **CSDA** inverse connector. We can now view inversed space; happening at a central force **F** system Center of Curvature; curvature κ.

Main body solution curves have negative and positive spirit in their whole solution (N&S hemisphere sharing spin and rotation) of indicated root composition. Composition parts become disassociated from main body curves when dependent solution curves are inversed. Both even indices solution curves (N&S) become asymptotic with plane of rotation *and* magnitude root abscissa identity. They cling close to main body solution curve of opposite character, (—) spirit of red main body solution curve next to inversed blue body curve, and (+) spirit of main body blue solution curve next to inversed red body curve. Close, but forever asymptoticly apart.

The parabolic shaped macro space solution curves are no longer attached with spin vertices. Red is no longer concave down at N spin vertex; becomes concave up, flatlining at spin axis intercept with + system curvature definition (κ), coming from 1st quadrant positive spin space, flatlines at $(F, +\kappa)$, leaves closed neighborhood of independent central force curve along (—, +) 2nd quadrant space spin axis.

Blue is no longer concave up at S spin vertex; becomes concave down, flatlining at spin axis intercept with system curvature definition (-κ), coming from 4th quadrant positive spin space, flatlines at $(F, -\kappa)$, leaves closed neighborhood of independent central force curve along (—, —) 3rd quadrant spin space.

Inversed even indices dependent main body solution curves

$$\{t, \left(\frac{t^8}{\pm 2} \mp \frac{7}{2}\right)^{-1}\},$$

Both main body solution curves $\{t, (\frac{t^8}{-2} + \frac{7}{2})^{-1}\}, \{t, (\frac{t^8}{+2} - \frac{7}{2})^{-1}\}$, positive and negative, when inversed, are forbidden asymptote crossover (to reach rotation plane). Asymptote is defined by the independent red line curvature definition $\{t, \left(\frac{7}{2}\right)^{-1}\}$ provided by the independent curve $\left\{\frac{7}{2}\mathrm{Cos}[t], \frac{7}{2}\mathrm{Sin}[t]\right\}$. Note; both inversed

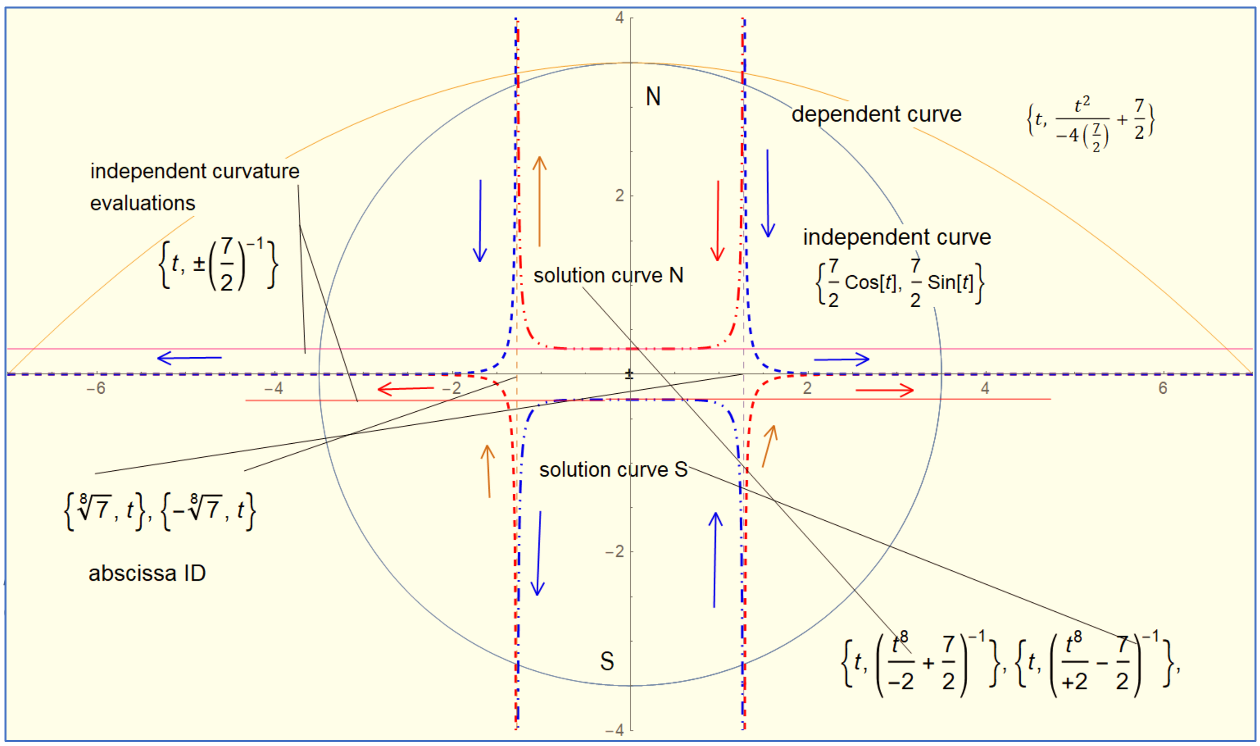


Figure 13: inversed even indices root solution curves.

main body solution curves flatline when meeting linear curvature limits provided by independent discovery curves.

Inversed main body solution curves, both red and blue, are forever trapped between (±) abscissa ID of the root definition and linear curvature limits of independent discovery curve. Note disassociation of main body solution curve character composition signing. Signed $(+\& -)$ parts composing solution curves, when inversed, disassociate from main body of curve, keeping $(+\& -)$ spirit from main body character. (—) spirit of main body (red solution) approach system rotation plane along $(-spin\ \infty)$, outside asymptote frame $(\pm root\ abscissa\ ID)$. Once crossing the independent red line curvature definition $\{t, -\left(\frac{7}{2}\right)^{-1}$, follow rotation infinity produced, leaving abscissa root definition, with respect to which side of abscissa ID red main body spirits arrive at rotation.

$(-spin\ \infty)$ has the main body blue solution curve vertex spin axis centered; the curve is forbidden crossing the independent curvature definition $\{t, -\left(\frac{7}{2}\right)^{-1}$ and is protected with (±) root ID as asymptote insulator, keeping negative charge of red solution curve isolated from the positive charge character composing the blue (S) main body solution curve.

Let signing of solution curves carry sign of slope event at positive latus rectum definition of magnitude.

(±) spirit of main body (blue solution) approach rotation from $(+\ spin\ \infty)$ along $(\pm root\ abscissa\ ID)$, Once crossing the independent curvature ID definition $\{t, +\left(\frac{7}{2}\right)^{-1}$, turn to follow rotation infinity away from abscissa definition.

I sign the spirit of solution curves with this arbitrary convention. The solution curve touching $\left(\frac{\pi}{2}\right)$ spin vertex is (negative) because the unit parabola vertex at this event is a concave down curve with 1st quadrant e-tangent slope $(m = -1)$ (negative slope 1st quadrant curve). Any solution curve touching the $\left(\frac{3\pi}{2}\right)$ **CSDA** spin vertex is a 4th quadrant positive slope curve. 4th quadrant e-tangent slope $(m = +1)$.

1st quadrant dependent definition curve: $\left(\frac{t^2}{-4(p)} + r\right)$.

4th quadrant dependent definition curve: $\left(\frac{t^2}{+4(p)} - r\right)$.

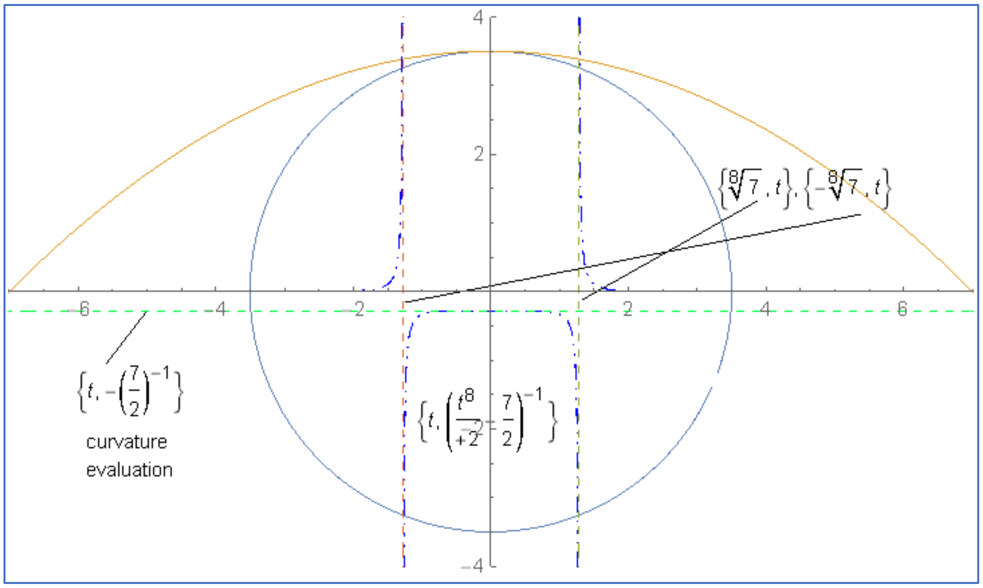


Figure 14: **CSDA** inverse of blue body solution curve (viewpoint; macro space (r) into central force curving phenomena (κ). (work curvature.nb)

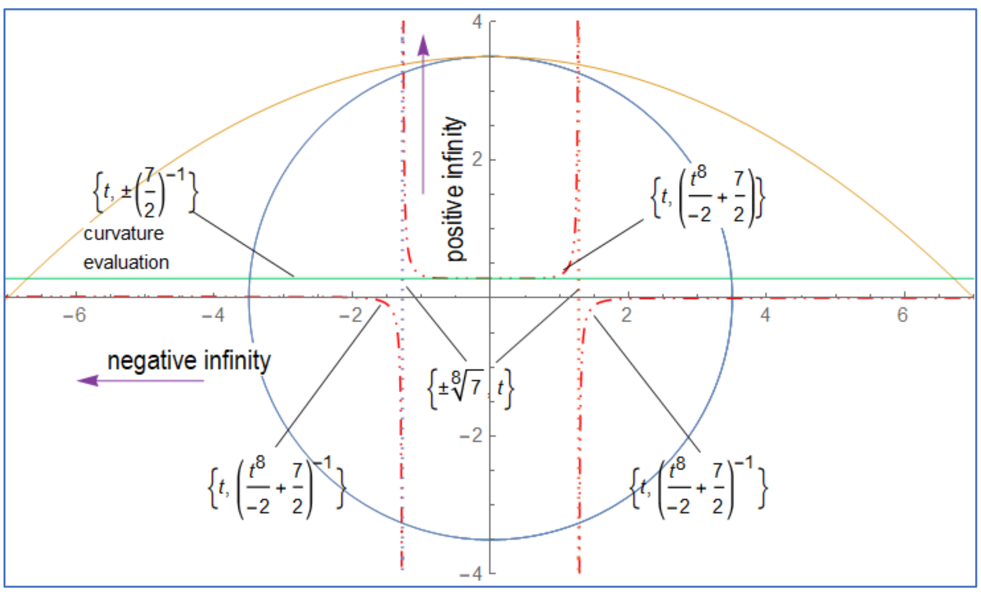


Figure 15: **CSDA** inverse of red body solution curve (viewpoint; macro space (r) into central force curving phenomena (κ). (work curvature.nb)

QED: Even indices solution curves and their inverse.

ALΣXANDΣR

CSDA construction curvature and radii of curves of roots having odd integer indices.

$(\sqrt[7]{7})$ square space curve analytics (radius view) of inverse square connector.

$$\text{ParametricPlot}[\{\{\tfrac{7}{2}\text{Cos}[t],\tfrac{7}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{7}{2}\right)}+\frac{7}{2}\},\{t,(\frac{t^7}{+2}-\frac{7}{2})\},\{t,(\frac{t^7}{-2}+\frac{7}{2})\},$$
$$\{\sqrt[7]{7},t\},\{-\sqrt[7]{7},t\}\},\{t,-8,8\},\text{PlotRange}\text{->}\{\{-7,7\},\{-4,4\}\},\text{AxesOrigin}\text{->}\{0,0\}]$$

CSDA macro space odd indices radii connection sketch unidirectional solution curves, approach **CSDA** parametric geometry function along ***negative*** side of spin infinity along positive side of negative abscissa root ID. When crossing over to ***positive*** side of spin space, they flatline at N & S vertices before diving toward

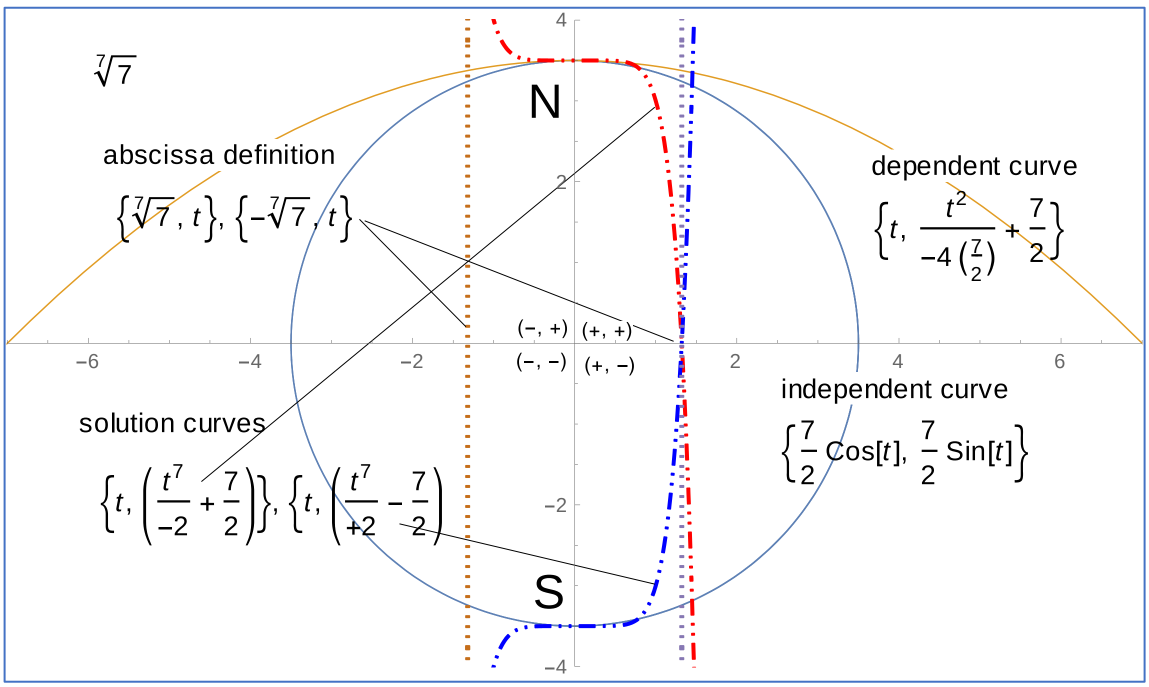


Figure 16: **CSDA** macro space radii evaluation of roots having odd indices: $\{\sqrt[7]{7},t\},\{-\sqrt[7]{7},t\}$. (work curvature.nb)

root definition on rotation plane. Root definition happens on positive side of spin. Both curves continue unidirectional on **CSDA** positive spin side, crossing over to like signed spin infinities on positive side of root abscissa ID with respect to rotation. Negative red on to $(-\ spin\ \infty)$ and positive blue on to $(+\ spin\ \infty)$.

$(\sqrt[7]{7})$ curved space curve analytics (curvature view) of inverse square connector.

$$\text{ParametricPlot}[\{\{\tfrac{7}{2}\text{Cos}[t],\tfrac{7}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{7}{2}\right)}+\frac{7}{2}\},\{t,\left(\frac{t^7}{+2}-\frac{7}{2}\right)^{-1}\},\{t,\left(\frac{t^7}{-2}+\frac{7}{2}\right)^{-1}\},$$
$$\{\sqrt[7]{7},t\},\{-\sqrt[7]{7},t\},\{t,(\tfrac{7}{2})^{-1}\},\{t,-(\tfrac{7}{2})^{-1}\},\{14^{1/7},t\}\},\{t,-8,8\},\text{PlotRange}\text{->}\{\{-7,7\},\{-4,4\}\},\text{AxesOrigin}\text{->}\{0,0\}]$$

Both square space unidirectional solution curves (±) character spirit are split from the inversed main body curve.

The up-spin spirit of red main body solution curve approach rotation from $(-spin\ \infty)$ alongside positive root abscissa ID asymptote, turns right (eye sight into paper) and recedes to positive rotation infinity.

The down-spin spirit of red main body solution curve approaches rotation along

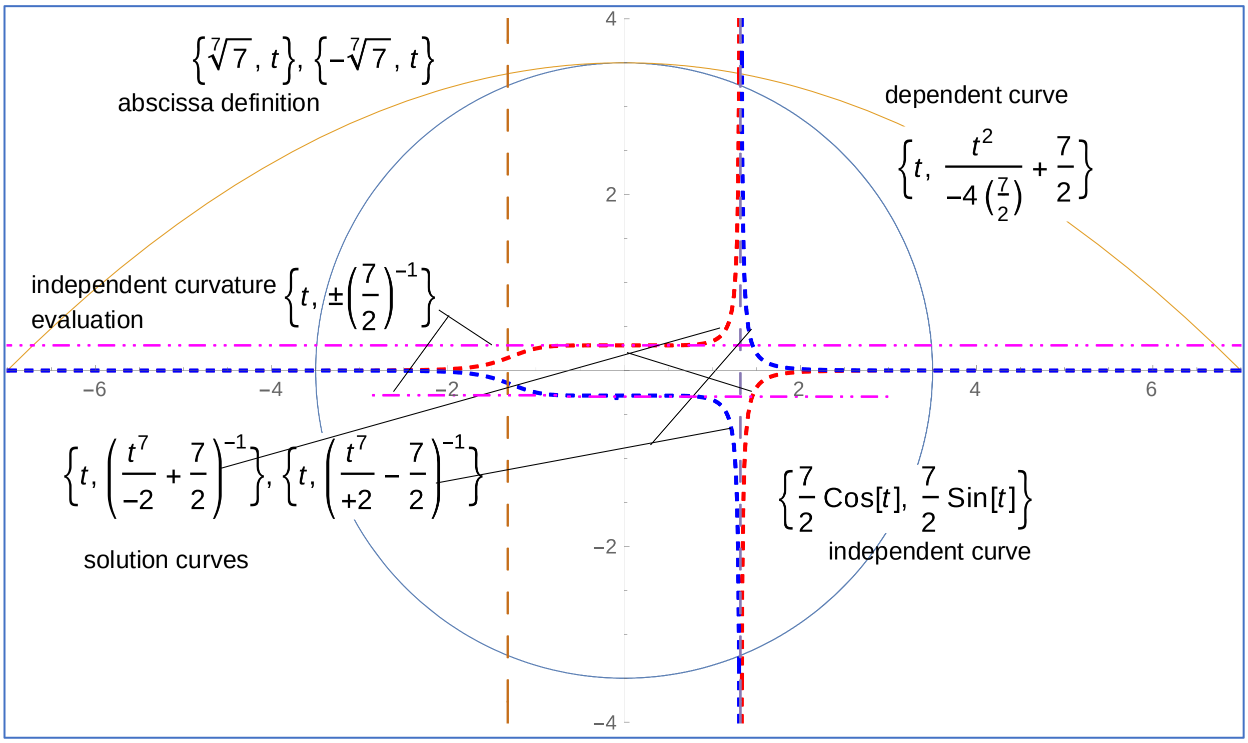


Figure 17: curved space view of inversed odd indices. Odd indices of square space radii produce unidirectional solution curves. Change shape and asymptote when inversed: $\{t,\left(\frac{t^7}{+2}-\frac{7}{2}\right)^{-1}\},\{t,\left(\frac{t^7}{-2}+\frac{7}{2}\right)^{-1}\}$

negative side of positive abscissa root ID from $(+spin\ \infty)$. Upon reaching the positive independent curvature limit $\left(\frac{7}{2}\right)^{-1}$, the curve flatlines, turns left, (eye sight into paper), and collapses onto rotation plane just past negative root ID, and recedes out to negative infinite square space rotation.

The down-spin spirit of blue main body solution curve approach rotation from $(+spin\ \infty)$ along positive side of positive root abscissa ID asymptote, turns right (eye sight into paper) and recedes to positive rotation infinity.

The up-spin spirit of main body blue solution curve approaches rotation along negative side of positive abscissa root ID from $(-spin\ \infty)$. Upon reaching the negative independent curvature limit $\left(\frac{-7}{2}\right)^{-1}$, the curve flatlines, turns left, (eye sight into paper), and collapses onto rotation plane just past negative root ID, and recedes out to negative infinite square space rotation.

QED: Odd indices solution curves and their inverse.

ALΣXANDΣR

Since I have signed red main body solution curves negative and blue body solution curves positive; I propose the following convention.

- Let curve direction point from infinite space to plane of rotation.
- If on a positive spin axis, or relative spin asymptote, such a curve needs down spiral, down-spin, to arrive at rotation.
- If on a negative spin axis, or relative spin asymptote, such a curve needs up spiral, up-spin, to reach rotation.
- Those curves out in infinite space of rotation, also have direction toward spin. Signing is arbitrary as to side of spin and sides of relative spin asymptotes. Those curves approaching central spin or relative central spin asymptotes from $(\pi)\ space\ rotation$ with respect spin, come from negative (left-side) infinity and are negative. Those curves approaching central spin or relative central spin asymptotes from $(2\pi)\ space$, come from positive (right-side) infinity and have positive spirit.

Even indices root constructions, when inversed, produce 3 apparitions. The main body captured between root ID and curvature limits of discovery and two spirit outside capture zone. Odd indices suffering mechanical inverse, produce only two apparition. I suspect the curves suffering flatline curvature limits asymptote is main body, the one reaching rotation unimpeded, are odd indices spirit curves.

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PART3: Trancensdentals Indices $\{\sqrt[\pi]{2}, t\}$

$$\text{ParametricPlot}[\{\{\tfrac{2}{2}\text{Cos}[t], \tfrac{2}{2}\text{Sin}[t]\}, \{t, \frac{t^2}{-4\left(\frac{2}{2}\right)} + \frac{2}{2}\}, \{t, \frac{t^\pi}{-2} + \frac{2}{2}\}, \{t, \frac{t^\pi}{+2} - \frac{2}{2}\},$$

$$\{\sqrt[\pi]{2}, t\}\}, \{t, -4, 4\}, \text{PlotRange}{-}{>}\ \{\{-3,3\}, \{-3,3\}\}, \text{AxesOrigin}{-}{>}\ \{0,0\}]$$

By (my own) convention, I use signing of dependent curve @ $\left(\frac{\pi}{2}\right)$ spin vertices $\left(\frac{+t^n}{-4(p)} + r\right)$. I also use color so as to follow spin vertex solution curves as we

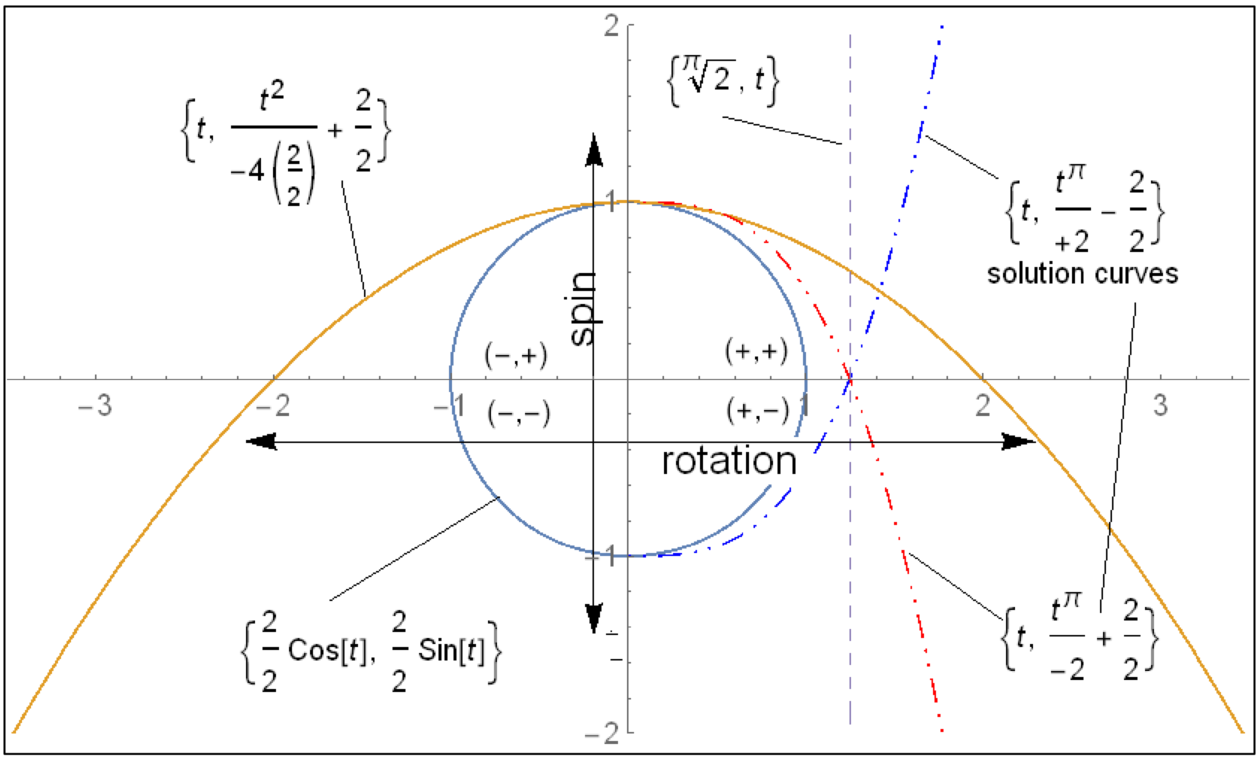


Figure 18: transcendental root $\{\sqrt[\pi]{2}, t\}$, macro space radii view. transcendental roots 1.nb

change constructed space view by inversing dependent parts of solution curves.

We see $\left(\frac{\pi}{2}\right)$ spin vertex is primitive origin for red negative solution curve.

We see $\left(\frac{3\pi}{2}\right)$ spin vertex is primitive origin for blue positive solution curve.

Transcendental solution curves source from positive side of spin. negative solution exists above rotation and positive solution below rotation.

inverse curvature evaluation of transcendental $\{\sqrt[\pi]{2}, t\}$

Same convention. Red negative main body solution curve still sources from $\left(N;\frac{\pi}{2}\right)$ spin vertex and blue positive main body solution curve still sources from $\left(S;\frac{3\pi}{2}\right)$ spin vertex

$$\text{ParametricPlot}[\{\{\tfrac{2}{2}\text{Cos}[t],\tfrac{2}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{2}{2}\right)}+\frac{2}{2}\},\{t,\left(\frac{t^\pi}{+2}-\frac{2}{2}\right)^{-1}\},\{t,\left(\frac{t^\pi}{-2}+\frac{2}{2}\right)^{-1}\},$$
$$\{\sqrt[\pi]{2},t\}\},\{t,-4,4\},\text{PlotRange}->\{\{-7/2,7/2\},\{-7/2,7/2\}\},\text{AxesOrigin}->\{0,0\}]$$

Note: both main body solution curves still source from positive side of spin.

Inversing solution curves; $\{t,(\frac{t^\pi}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^\pi}{-2}+\frac{2}{2})^{-1}\}$, causes $(positive\ \text{ or } negative)$ spirit carried by each main body curve, to become separated from primitive source point of origin. Both root solution curves source from (spin axis) vertices. When solution curves are inversed, the abscissa root ID becomes asymptotic keeping separate main body solution curves from acompanying spirit curves.

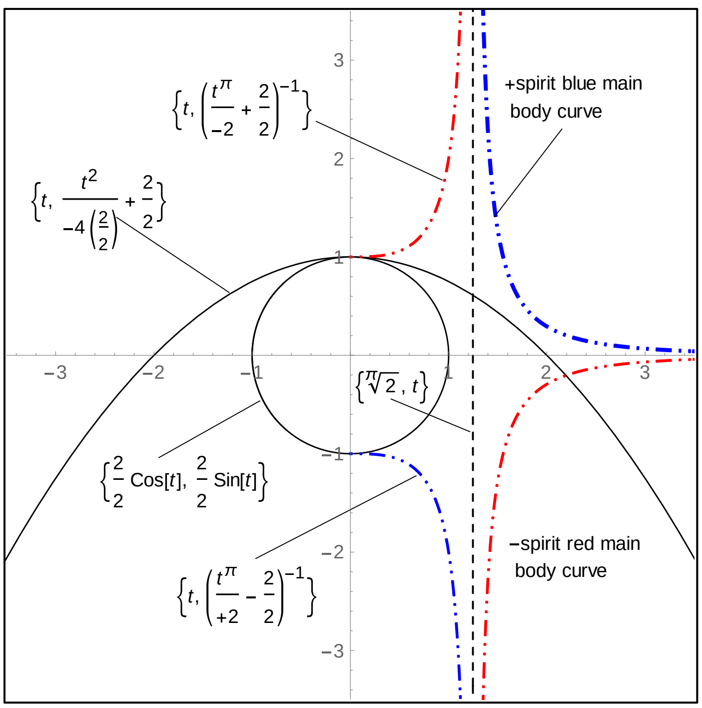


Figure 19: transcendental root $\{\sqrt[\pi]{2}, t\}$ inversed, micro space curvature view. transcendental roots 1.nb

Note distribution of spirit signing connected with inversed main body curve. Negative spirit south of rotation and positive spirit north of rotation.

Blue spirit approach is from $(+spin\infty)$, turns right (eyesight into paper) and recedes to $(+rotation\infty)$.

Red spirit approach is from $(-spin\infty)$, turns right (eyesight into paper) and recedes to $(+rotation\infty)$.

CSDA demonstration $\left(\sqrt[\pi]{3}\right)$ center of curvature to macro space radii evaluation

$$\text{ParametricPlot}[\{\{\tfrac{3}{2}\text{Cos}[t],\tfrac{3}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{3}{2}\right)}+\frac{3}{2}\},\{t,(\frac{t^\pi}{-2}+\frac{3}{2})\},\{t,(\frac{t^\pi}{+2}-\frac{3}{2})\},\{t,\frac{2}{3}\},\{t,\frac{-2}{3}\},$$
$$\{t,(\frac{t^\pi}{-2}+\frac{3}{2})\},\{t,(\frac{t^\pi}{+2}-\frac{3}{2})\},\{\sqrt[\pi]{3},t\}\},\{t,-\frac{7}{2},\frac{7}{2}\},\text{PlotRange}\text{->}\{\{-\frac{7}{2},\frac{7}{2}\},\{-\frac{5}{2},\frac{5}{2}\}\},\text{AxesOrigin}\text{->}\{0,0\}]$$

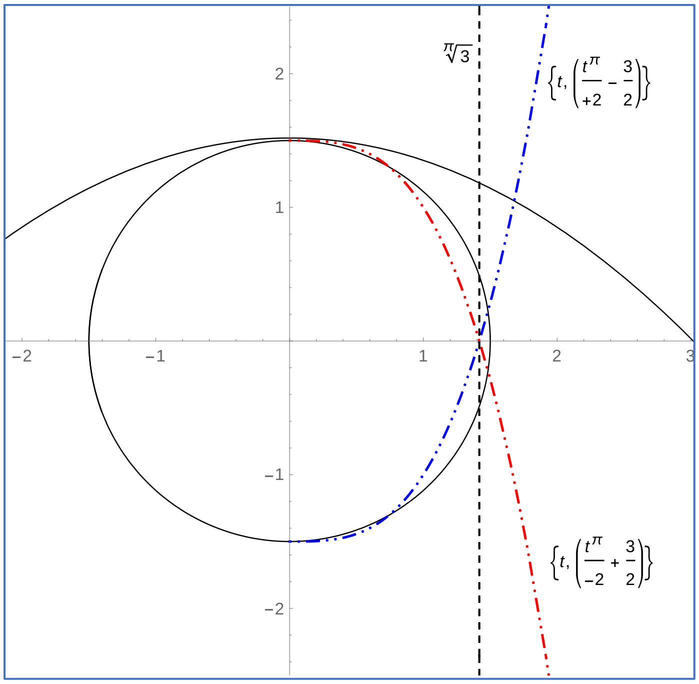


Figure 20: : transcendental root $\{\sqrt[\pi]{3},t\}$ macro space radii view.
transcendental roots 1.nb

Red is negative main body solution curve.

Blue is positive main body solution curve

Radicand number has been changed from (2) to (3)

Root solution has become part of micro infinity discovery curve.

Both main body solution curves still source from N&S discovery curve spin vertices.

We see $\left(\frac{\pi}{2}\right)$ spin vertex is primitive origin for red negative solution curve.

We see $\left(\frac{3\pi}{2}\right)$ spin vertex is primitive origin for blue positive solution curve.

Transcendental solution curves source from positive side of spin. negative solution exists above rotation and positive solution below rotation.

CSDA demonstration $\left(\sqrt[\pi]{3}\right)$ Inversed Curvature view evaluation

$$\text{ParametricPlot}[\{\{\tfrac{3}{2}\text{Cos}[t],\tfrac{3}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{3}{2}\right)}+\frac{3}{2}\},\{t,(\frac{t^\pi}{-2}+\frac{3}{2})\},\{t,(\frac{t^\pi}{+2}-\frac{3}{2})\},\{t,\frac{2}{3}\},\{t,\frac{-2}{3}\},\{t,\left(\frac{t^\pi}{-2}+\frac{3}{2}\right)^{-1}\},\{t,(\frac{t^\pi}{+2}-\frac{3}{2})^{-1}\},\{\sqrt[\pi]{3},t\}\},\{t,-\frac{7}{2},\frac{7}{2}\},\text{PlotRange}\text{->}\{\{-\frac{7}{2},\frac{7}{2}\},\{-\frac{5}{2},\frac{5}{2}\}\},\text{AxesOrigin}\text{->}\{0,0\}]$$

Abscissa ID $\{\sqrt[\pi]{3},t\}$ and independent curve $\{\frac{3}{2}\text{Cos}[t],\frac{3}{2}\text{Sin}[t]$ curvature limits $\{t,\frac{2}{3}\},\{t,\frac{-2}{3}\}$ are relative spin/rotation asymptotes of magnitude 3 inverse square connector. Solution curves still source from positive side of spin @ $\left(\frac{\pi}{2}\ and\ \frac{3\pi}{2}\right)$ vertices. But *inversed* solution curves source from positive side of spin @ $(+\ and\ -)$ curvature evaluation of independent **CSDA** curve $\{\frac{3}{2}\text{Cos}[t],\frac{3}{2}\text{Sin}[t]\}$ as relative rotation asymptotes.

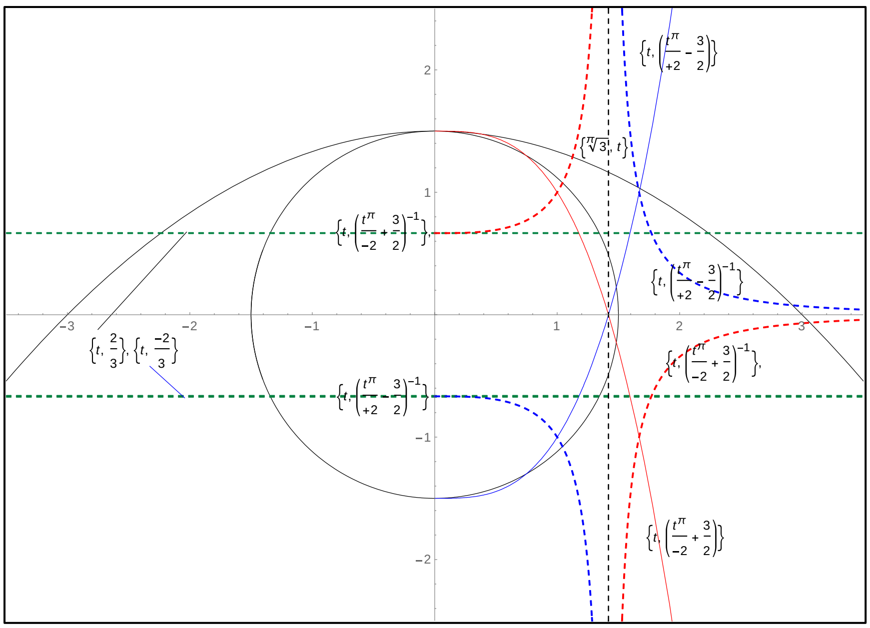


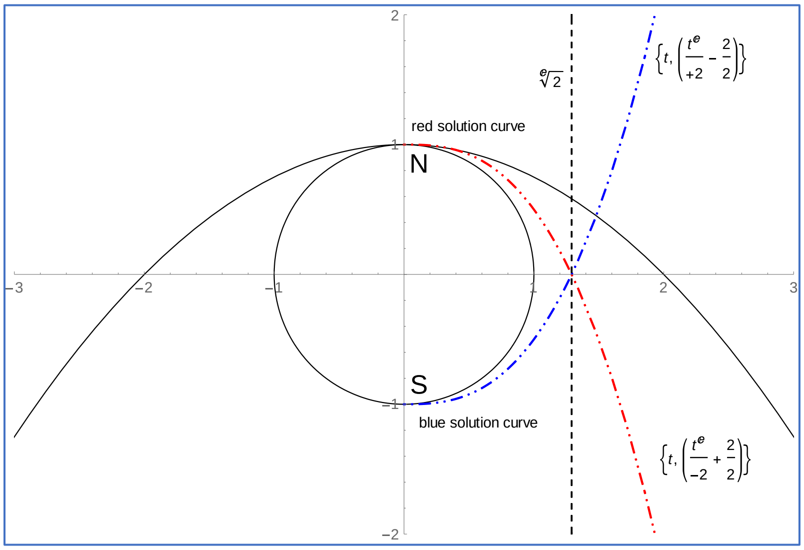
Figure 21: **CSDA** curved space parametric geometry construction for magnitude root $\{\sqrt[\pi]{3},t\}$ inverse. Note inversed curves no longer source from spin vertices, but still source from positive side spin axis along curvature limits of independent central force curve. transcendental roots 1.nb

Positive spirit of blue main body solution curve approaches rotation plane from $(+spin\infty)$, turns right (eyesight into paper) and recedes to $(+rotation\infty)$.

Red spirit approach is from $(-spin\infty)$, turns right (eyesight into paper) and recedes to $(+rotation\infty)$.

$$\{\sqrt[e]{2}, t\}$$

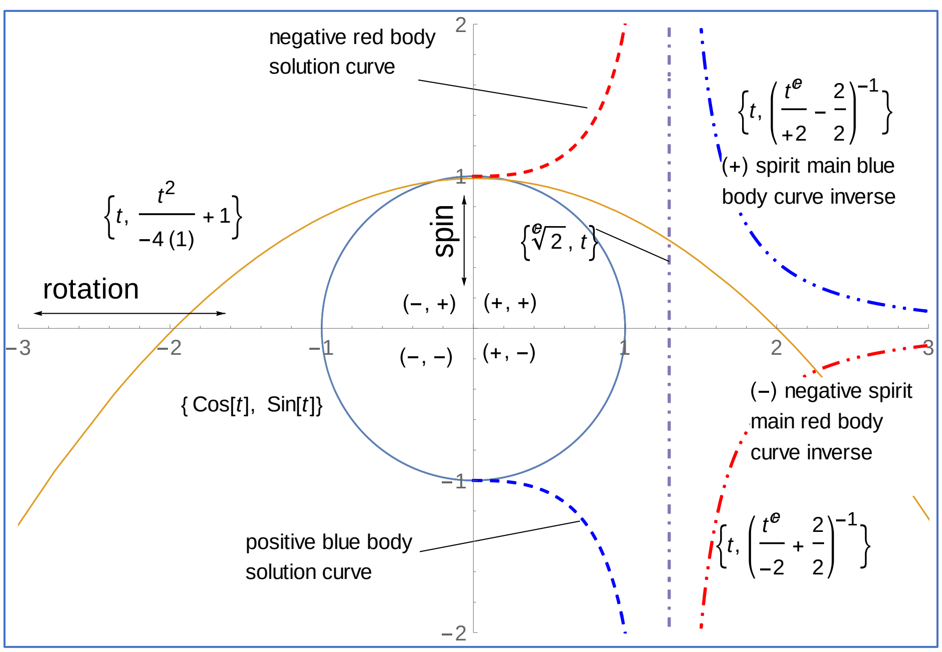
$$\text{ParametricPlot}[\{\{\text{Cos}[t], \text{Sin}[t]\}, \{t, \frac{t^2}{-4(1)} + 1\}, \{t, (\frac{t^e}{-2} + \frac{2}{2})\}, \{t, (\frac{t^e}{+2} - \frac{2}{2})\}, \{\sqrt[e]{2}, t\}\}, \{t, -\pi, \pi\}, \text{PlotRange} -> \{\{-3,3\}, \{-2,2\}\}, \text{AxesOrigin} -> \{0,0\}]$$



Exponential (e) as index for radicand (2) seems to possess same parameters as (π).

Figure 22: CSDA parametric geometry construction of transcendental $\{\sqrt[e]{2}, t\}$. transcendental roots 1.nb

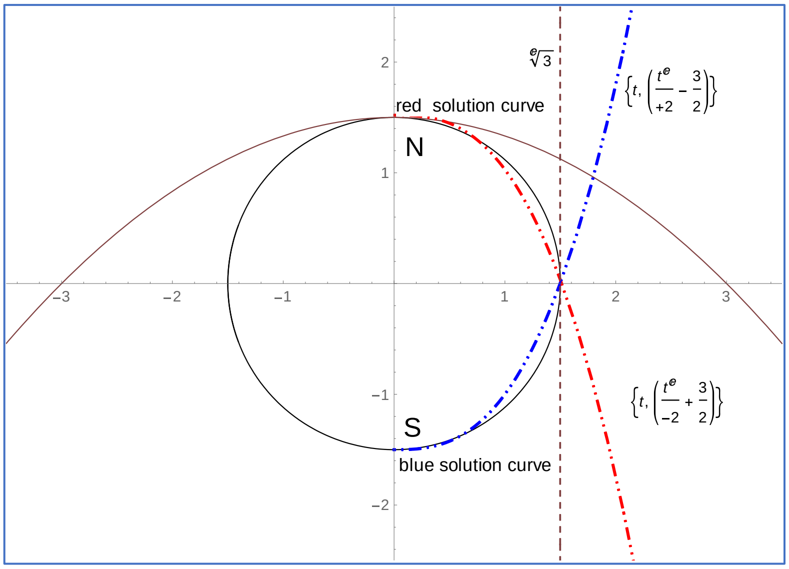
$$\text{ParametricPlot}[\{\{\text{Cos}[t], \text{Sin}[t]\}, \{t, \frac{t^2}{-4(1)} + 1\}, \{t, \left(\frac{t^e}{-2} + \frac{2}{2}\right)^{-1}\}, \{t, \left(\frac{t^e}{+2} - \frac{2}{2}\right)^{-1}\}, \{\sqrt[e]{2}, t\}\}, \{t, -9, 9\}, \text{PlotRange} -> \{\{-3,3\}, \{-2,2\}\}, \text{AxesOrigin} -> \{0,0\}]$$



Inversing Exponential (e) as index for radicand (2) seems to possess same parameters as (π) as index for radicand (2).

Figure 23: CSDA parametric geometry construction of transcendental $\{\sqrt[e]{2}, t\}$. transcendental roots 1.nb

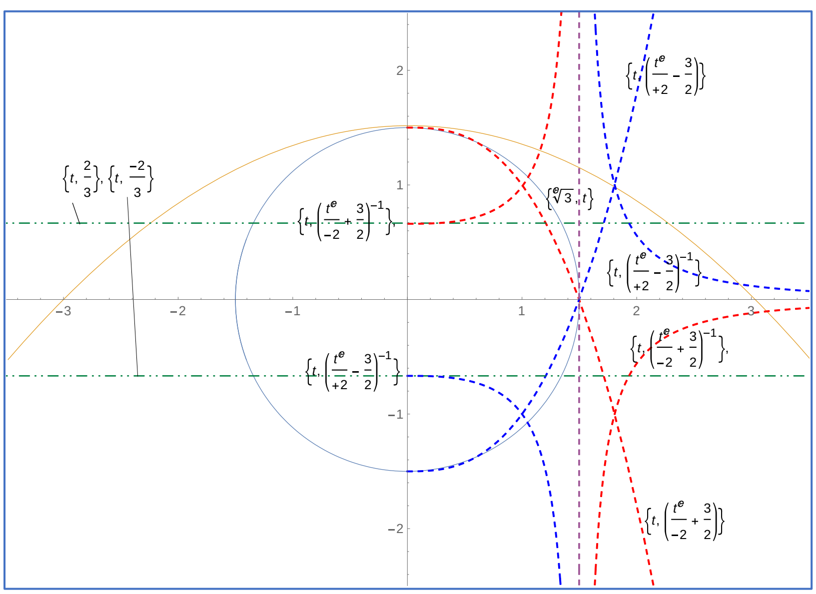
$$\text{ParametricPlot}[\{\{\tfrac{3}{2}\text{Cos}[t], \tfrac{3}{2}\text{Sin}[t]\}, \{t, \tfrac{t^2}{-4\left(\frac{3}{2}\right)} + \tfrac{3}{2}\}, \{t, (\tfrac{t^e}{-2} + \tfrac{3}{2})\}, \{t, (\tfrac{t^e}{+2} - \tfrac{3}{2})\}, \{t, \tfrac{2}{3}\}, \{t, \tfrac{-2}{3}\}, \{t, (\tfrac{t^e}{-2} + \tfrac{3}{2})\},$$
$$\{t, (\frac{t^e}{+2} - \frac{3}{2})\}, \{\sqrt[e]{3}, t\}\}, \{t, -\frac{7}{2}, \frac{7}{2}\}, \text{PlotRange} -> \{\{-\frac{7}{2}, \frac{7}{2}\}, \{-\frac{5}{2}, \frac{5}{2}\}\}, \text{AxesOrigin} -> \{0,0\}]$$



$\{\sqrt[e]{3}, t\}\}$ Exponential (e); transcendental sameness.

Figure 24: CSDA parametric geometry construction of transcendental $\{\sqrt[e]{3}, t\}$ transcendental roots 1.nb

$$\text{ParametricPlot}[\{\{\frac{3}{2}\text{Cos}[t], \frac{3}{2}\text{Sin}[t]\}, \{t, \frac{t^2}{-4\left(\frac{3}{2}\right)} + \frac{3}{2}\}, \{t, (\frac{t^e}{-2} + \frac{3}{2})\}, \{t, (\frac{t^e}{+2} - \frac{3}{2})\}, \{t, \frac{2}{3}\}, \{t, \frac{-2}{3}\}, \{t, \left(\frac{t^e}{-2} + \frac{3}{2}\right)^{-1}\}, \{t, \left(\frac{t^e}{+2} - \frac{3}{2}\right)^{-1}\},$$
$$\{\sqrt[e]{3}, t\}\}, \{t, -\frac{7}{2}, \frac{7}{2}\}, \text{PlotRange} -> \{\{-\frac{7}{2}, \frac{7}{2}\}, \{-\frac{5}{2}, \frac{5}{2}\}\}, \text{AxesOrigin} -> \{0,0\}]$$



$$\left(\sqrt[e]{3}\right)^{-1}$$

exponential (e) transcendental sameness. Note main body solution curves source from discovery curve curvature limits.

Figure 25: CSDA parametric geometry construction of transcendental $\{\sqrt[e]{3}^{-1}, t\}$ inverse. transcendental roots 1.nb

transcendental index for radicand (8)

$$\text{ParametricPlot}[\{\{\tfrac{8}{2}\text{Cos}[t],\tfrac{8}{2}\text{Sin}[t]\},\{t,\tfrac{1}{4}\},\{t,\tfrac{-1}{4}\},\{t,\frac{t^2}{-4\left(\frac{8}{2}\right)}+\frac{8}{2}\},\{t,\left(\frac{t^\pi}{-2}+\frac{8}{2}\right)^{-1}\},\{t,\left(\frac{t^\pi}{+2}-\frac{8}{2}\right)^{-1}\},\{\sqrt[\pi]{8},t\}\},$$
$$\{t,-9,9\},\text{PlotRange}\text{->}\{\{-10,10\},\{-6,6\}\},\text{AxesOrigin}\text{->}\{0,0\}]$$

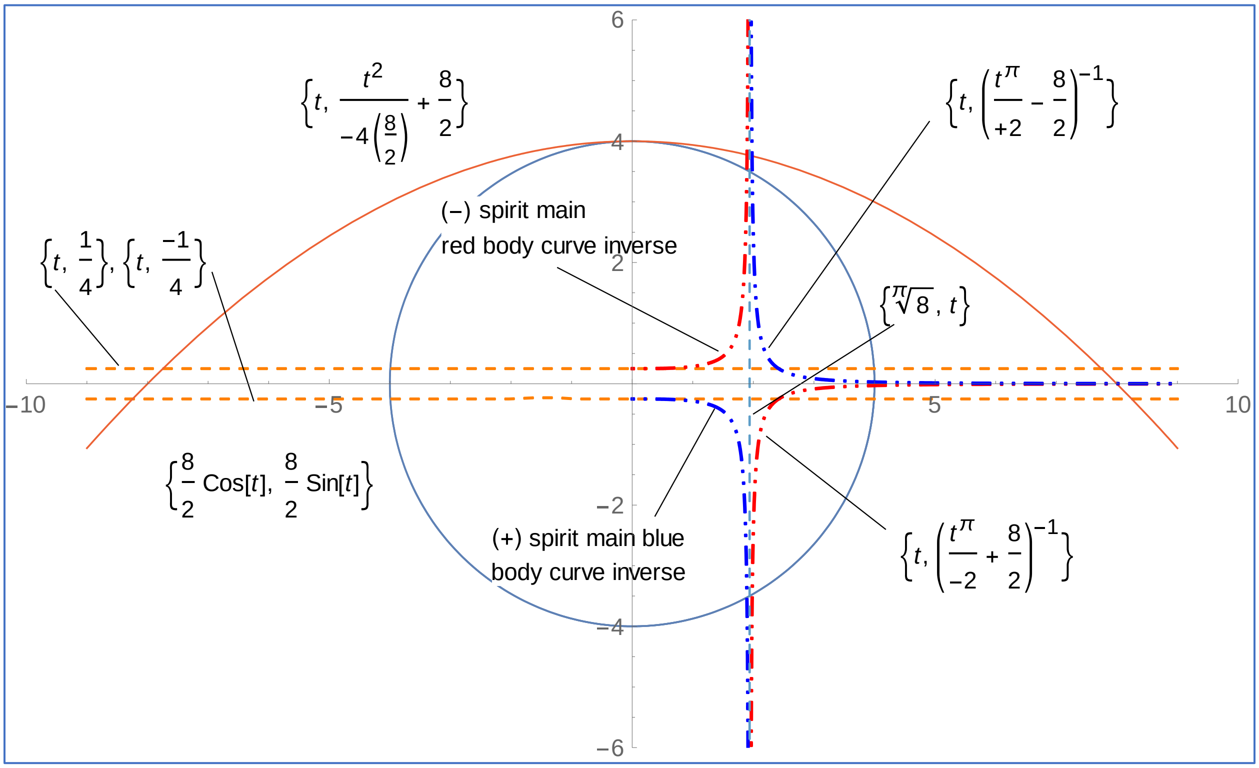


Figure 26: CSDA curved space construction of transcendental inversed root $\{\sqrt[\pi]{8},t\}$

Even indices have negative and positive abscissa root identification. Curvature limits of discovery become relative rotation asymptotes. Root abscissa identities become relative spin asymptotes. Together, they give a precise infinite volume of operating space for **F**.

Odd indices use the positive abscissa root ID as relative spin asymptote. curvature limits of discovery are relative rotation asymptotes.

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on indexing transcendental curved space to radicand greater than 2.

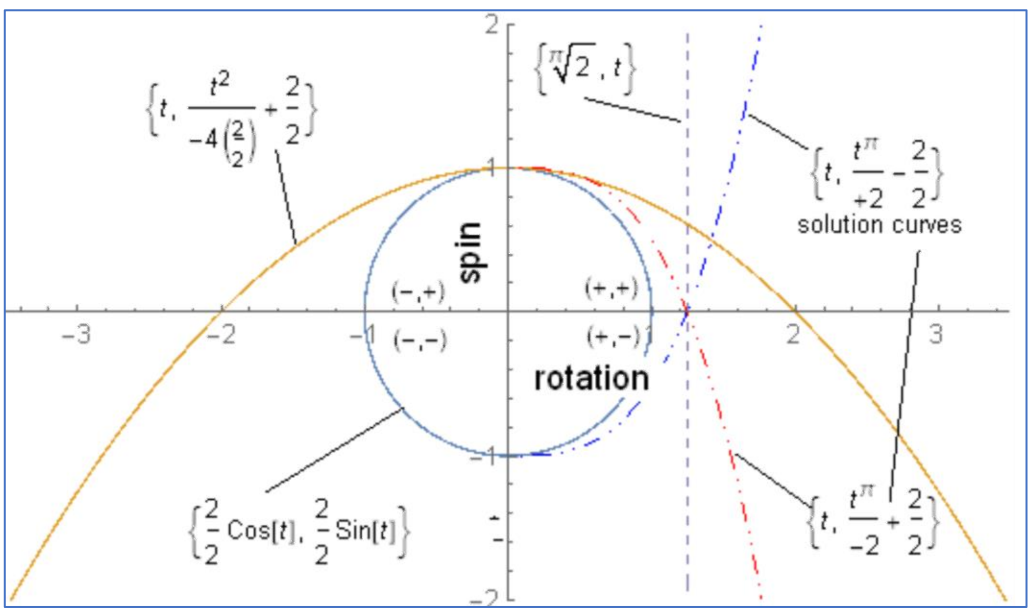
Sir Isaac Newton's Universal Law only variable is essentially square of curvature.

$$\left(\frac{1}{r}\right)^2$$

When taking root of radicand 2 with transcendental indices, solution curves source from unit(y) circle (r = 1) N and S poles.

As radicand increases, we find inversed solution curves source from independent curvature of central force limits.

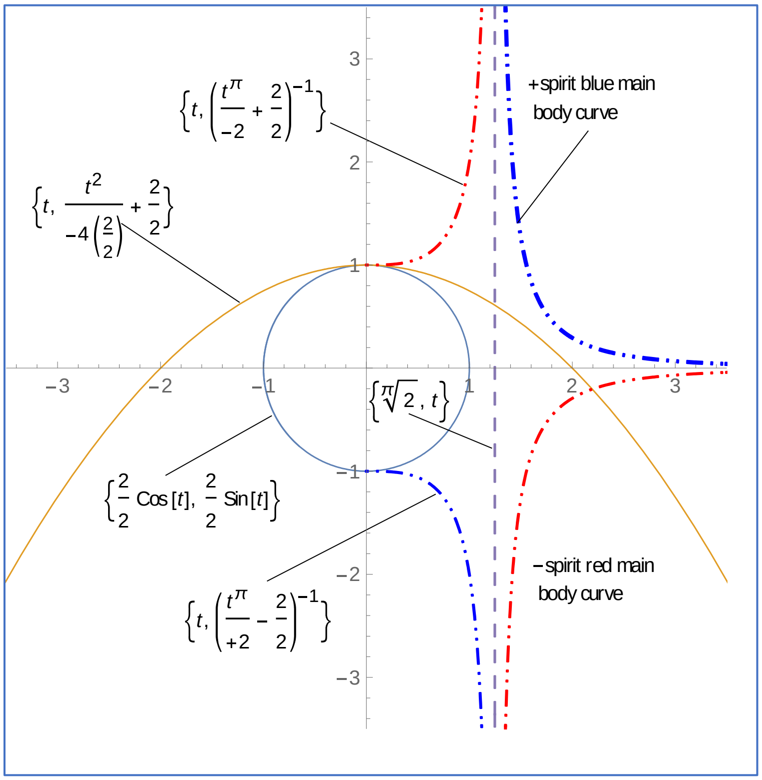
$$\text{ParametricPlot}[\{\{\tfrac{2}{2}\text{Cos}[t], \tfrac{2}{2}\text{Sin}[t]\}, \{t, \frac{t^2}{-4\left(\frac{2}{2}\right)} + \frac{2}{2}\}, \{t, \frac{t^\pi}{-2} + \frac{2}{2}\}, \{t, \frac{t^\pi}{+2} - \frac{2}{2}\}, \{\sqrt[\pi]{2}, t\}\}, \{t, -4, 4\},$$
$$\text{PlotRange} -> \{\{-7/2\,, 7/2\}, \{-2, 2\}\}, \text{AxesOrigin} -> \{0, 0\}]$$



Note both (±) solution curves for $\left(\sqrt[\pi]{2}\right)$ source from positive spin at poles of central force **F**.

Invert solution curves for $(\sqrt[\pi]{2})$

$$\text{ParametricPlot}[\{\{\tfrac{2}{2}\text{Cos}[t],\tfrac{2}{2}\text{Sin}[t]\},\{t,\frac{t^2}{-4\left(\frac{2}{2}\right)}+\frac{2}{2}\},\{t,\left(\frac{t^\pi}{-2}+\frac{2}{2}\right)^{-1}\},\{t,\left(\frac{t^\pi}{+2}-\frac{2}{2}\right)^{-1}\},$$
$$\{\sqrt[\pi]{2},t\}\},\{t,-4,4\},\text{PlotRange}\text{−>}\{\{-7/2,7/2\},\{-7/2,7/2\}\},\text{AxesOrigin}\text{−>}\{0,0\}]$$



Note inversed solution curves still source from counting integer two central force independent curves.

If we increase radicand from central force displacement radii (2) to displacement radii 8 units, we see the following happenings:

$$\text{ParametricPlot}[\{\{\tfrac{8}{2}\text{Cos}[t],\tfrac{8}{2}\text{Sin}[t]\},\{t,\tfrac{1}{4}\},\{t,\tfrac{-1}{4}\},\{t,\frac{t^2}{-4\left(\frac{8}{2}\right)}+\frac{8}{2}\},\{t,(\frac{t^\pi}{-2}+\frac{8}{2})\},$$
$$\{t,\left(\frac{t^\pi}{-2}+\frac{8}{2}\right)^{-1}\},\{t,(\frac{t^\pi}{+2}-\frac{8}{2})\},\{t,\left(\frac{t^\pi}{+2}-\frac{8}{2}\right)^{-1}\},\{\sqrt[\pi]{8},t\}\},\{t,-9,9\},$$
$$\pi\text{PlotRange}\text{−>}\{\{-9,9\},\{-6,6\}\},\text{AxesOrigin}\text{−>}\{0,0\}]$$

Transcendental index (π) for Sir Isaac Newton's displacement radius 8 units Central Force Space.

$$\{t,(\frac{t^{\pi}}{-2}+\frac{8}{2})\},\{t,\left(\frac{t^{\pi}}{-2}+\frac{8}{2}\right)^{-1}\},\{t,(\frac{t^{\pi}}{+2}-\frac{8}{2})\},\{t,\left(\frac{t^{\pi}}{+2}-\frac{8}{2}\right)^{-1}\}$$

$$\text{ParametricPlot}[\{\{\frac{8}{2}\text{Cos}[t],\frac{8}{2}\text{Sin}[t]\},\{t,\frac{1}{4}\},\{t,\frac{-1}{4}\},\{t,\frac{t^2}{-4\left(\frac{8}{2}\right)}+\frac{8}{2}\},\{t,(\frac{t^{\pi}}{-2}+\frac{8}{2})\},$$
$$\{t,\left(\frac{t^{\pi}}{-2}+\frac{8}{2}\right)^{-1}\},\{t,(\frac{t^{\pi}}{+2}-\frac{8}{2})\},\{t,\left(\frac{t^{\pi}}{+2}-\frac{8}{2}\right)^{-1}\},\{\sqrt[\pi]{8},t\}\},\{t,-9,9\},$$
$$\text{PlotRange}\text{->}\{\{-9,9\},\{-6,6\}\},\text{AxesOrigin}\text{->}\{0,0\}]$$

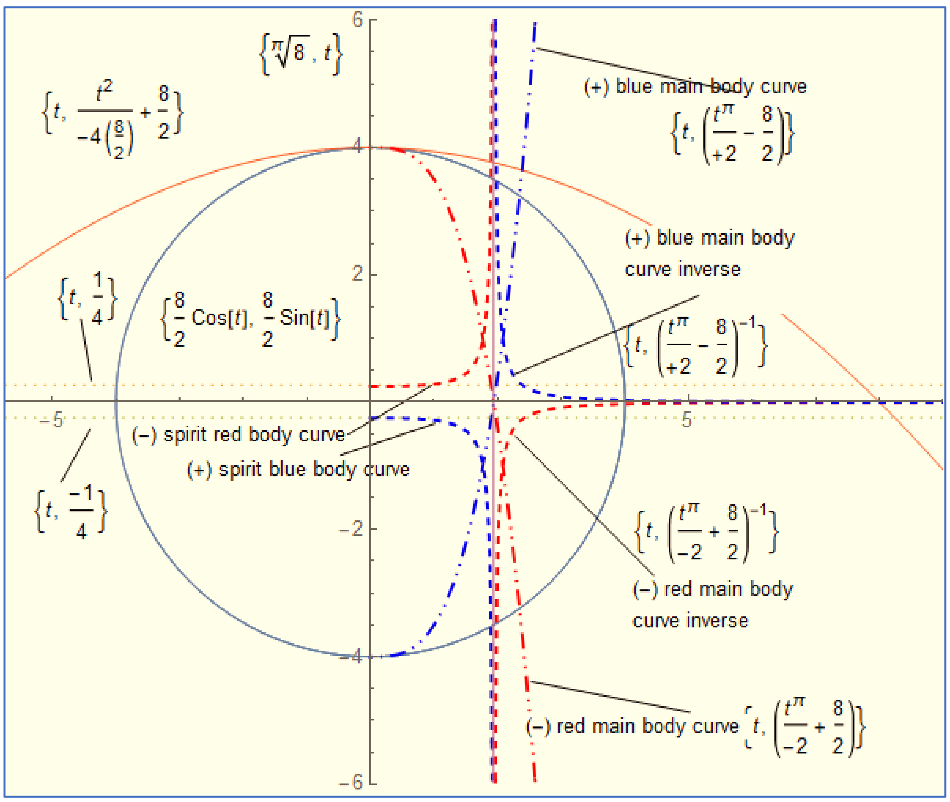


Figure 27: root solution curves are double dot with hash marks. inverse root curves are single hash marks. Red is negative and blue is positive. Central force curvature limits of F are single dot red. Note all accretion events source from positive spin and obey abscissa asymptotic definition of root$\left(\sqrt[\pi]{8}\right)$.

This construction demonstrates transcendental index (π) on central force displacement radii (8 units space). Root solution sources from positive spin poles (± 4). Inverse of root solution curves source at central force curvature limits $\left(\pm\frac{1}{4}\right)$.

Part 4

Phylosphical inquiry into interger radicand description of a centrist philosophy for constructing roots of magnitude for, 1-space, 2-space, 3-space, and 4-space.

When constructing roots of space curve magnitudes, I find no discernible change when conducting indices on radicand two. All root solutions (red&blue) source from **CSDA** spin axis N&S. I intend to use radicand (2) as descriptor of Natural 2-space central force construction. Background of such a construction is Cartesian. Let the origin be central force **F**. let $\left(\frac{\pi}{2}\&\frac{3\pi}{2}\right)$ direction radii spin, and $(\pi\&2\pi)$ direction radii rotate.

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{t,\frac{t^2}{+4(1)}-1\},\{\sqrt[1]{2},t\},\{t,\frac{t^1}{-2}+\frac{2}{2}\},\{t,\frac{t^1}{+2}-\frac{2}{2}\},$$

$$\{t,(\frac{t^1}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^1}{-2}+\frac{2}{2})^{-1}\},\{t,1\},\{t,-1\}\},\{t,-\pi,\pi\},\text{PlotRange}\rightarrow\{\{-3,3\},\{\frac{-3}{2},\frac{3}{2}\}\}]$$

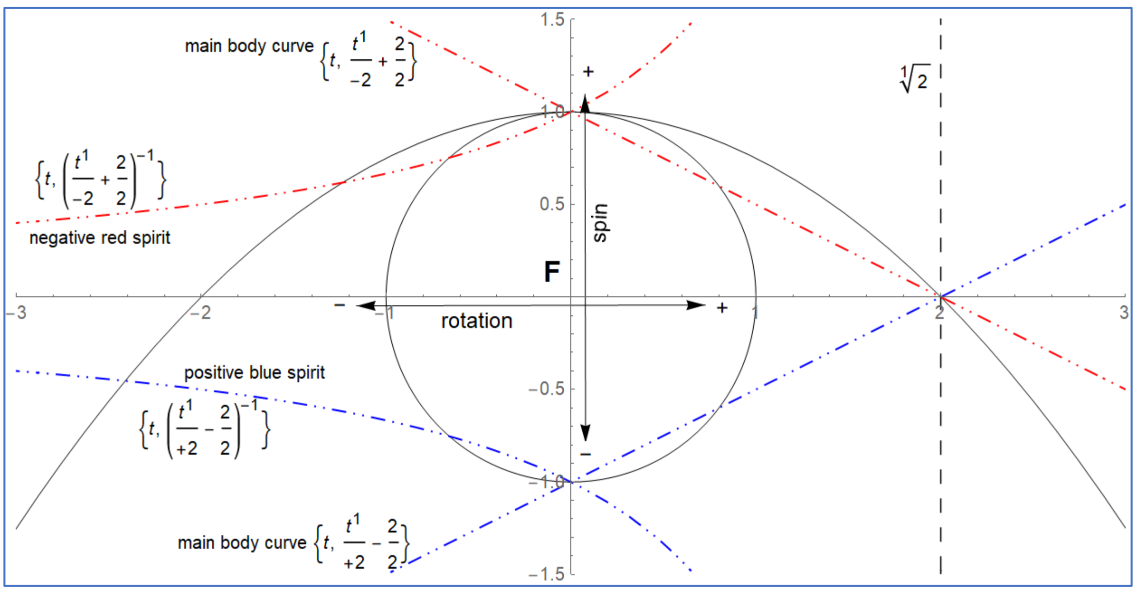


Figure 28: CSDA parametric geometry construction of 1st index linear (degree 1) root of Natural 2-space. Scratch curves.nb

- $\{t,\frac{t^1}{-2}+\frac{2}{2}\},\{t,\frac{t^1}{+2}-\frac{2}{2}\}$. Negative and positive main body solution curves. Macro space radii into micro infinity curvature. Linear view into curved space .
- $\{t,(\frac{t^1}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^1}{-2}+\frac{2}{2})^{-1}\}$. Inversed main body curves; linear root solution are straight line to abscissa index of root. Inverse of linear solution curves are no longer straight becoming curved? No second degree exponents to produce curve?

Degree two (index 2) rotation magnitude root of Natural 2-space

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{t,\frac{t^2}{+4(1)}-1\},\{\sqrt[2]{2},t\},\{t,\frac{t^2}{-2}+\frac{2}{2}\},$$
$$\{t,\frac{t^2}{+2}-\frac{2}{2}\},\{t,(\frac{t^2}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^2}{-2}+\frac{2}{2})^{-1}\}\},\{t,-\pi,\pi\},\text{PlotRange}\rightarrow\{\{-3,3\},\{\frac{-3}{2},\frac{3}{2}\}\}]$$

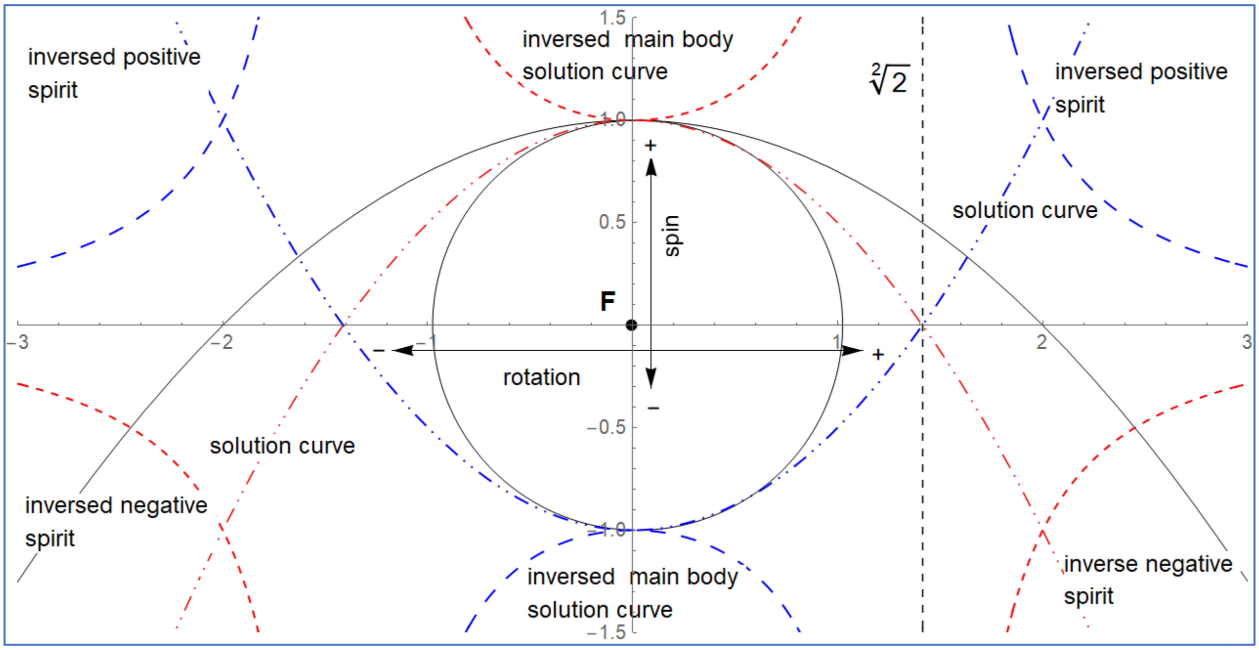


Figure 29: CSDA curved space construction of 2-space rotation magnitude, $\pm\sqrt[2]{2}$ solution curves and their inverse. (Scratch curves.nb)

- $\{t,\frac{t^2}{-2}+\frac{2}{2}\},\{t,\frac{t^2}{+2}-\frac{2}{2}\}$. Main body solution curve $(-red\ and + blue)$.
- $\{t,(\frac{t^2}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^2}{-2}+\frac{2}{2})^{-1}\}$. Main body curves inversed. We see three dissociation of main body solution. Main body inverse appears at spin axis. Red $(-)$ inverse at N spin vertex and blue $(+)$ inverse at S spin vertex. Both curves have vertices touching curvature evaluation. I did not construct the discovery curve limits, they are spin vertex tangent, normal with spin axis. The parametric discription will be
- Negative inverse: $\{t,1\}$. This is $(+)$ curvature limit of discovery curve; red body inverse is forbidden contact with rotation plane. Its vertex opens out to positive spin infinity.
- Positive inverse: $\{t,-1\}$ This is $(-)$ curvature limit of discovery curve; blue body inverse is forbidden contact with rotation plane. Its vertex opens out to negative spin infinity.
- We have two spirits for each main body. (+) spirit parts above rotation and negative spirit parts below rotation.

Degree three (index 2) rotation magnitude root of Natural 2-space

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{t,\frac{t^2}{+4(1)}-1\},\{\sqrt[3]{2},t\},\{t,\frac{t^3}{-2}+\frac{2}{2}\},\{t,\frac{t^3}{+2}-\frac{2}{2}\},\{t,(\frac{t^3}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^3}{-2}+\frac{2}{2})^{-1}\}\},\{t,-3\pi,3\pi\},\text{PlotRange}\to\{\{-5,7\},\{-3,7\}\}]$$

Solution curves and their inverse touch discovery curve (N&S) spin vertices. Inversed curves, spirit and main body become asymptote sensitive with rotation and abscissa ID of root $\sqrt[3]{2}$. One root and one abscissa root ID with degree 3 exponents.

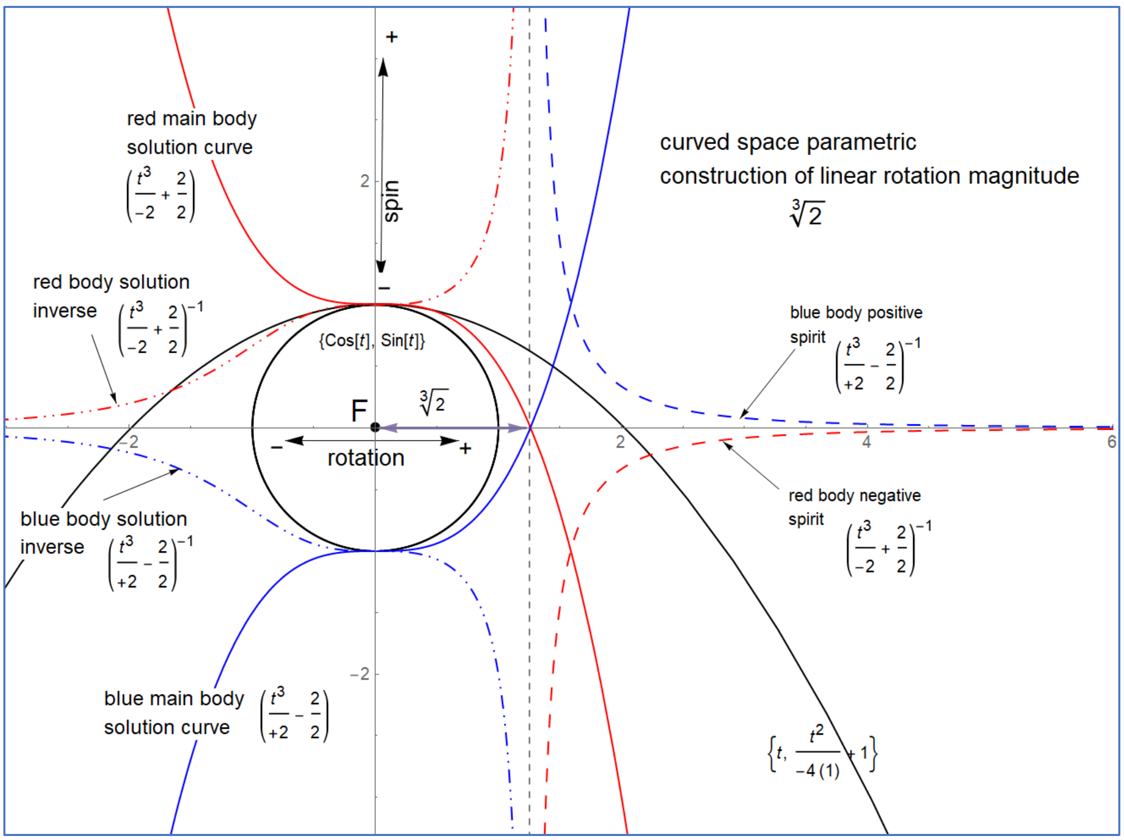


Figure 30: CSDA construction of $\sqrt[3]{2}$ central force rotation magnitude. (space roots.nb)

Index 4

$$\text{ParametricPlot}[\{\{\text{Cos}[t],\text{Sin}[t]\},\{t,\frac{t^2}{-4(1)}+1\},\{t,\frac{t^2}{+4(1)}-1\},\{\sqrt[4]{2},t\},\{t,\frac{t^4}{-2}+\frac{2}{2}\},\{t,\frac{t^4}{+2}-\frac{2}{2}\},\{t,(\frac{t^4}{+2}-\frac{2}{2})^{-1}\},\{t,(\frac{t^4}{-2}+\frac{2}{2})^{-1}\}\},\{t,-\pi,\pi\},\text{PlotRange}\rightarrow\{\{-3,3\},\{\frac{-3}{2},\frac{3}{2}\}\}]$$

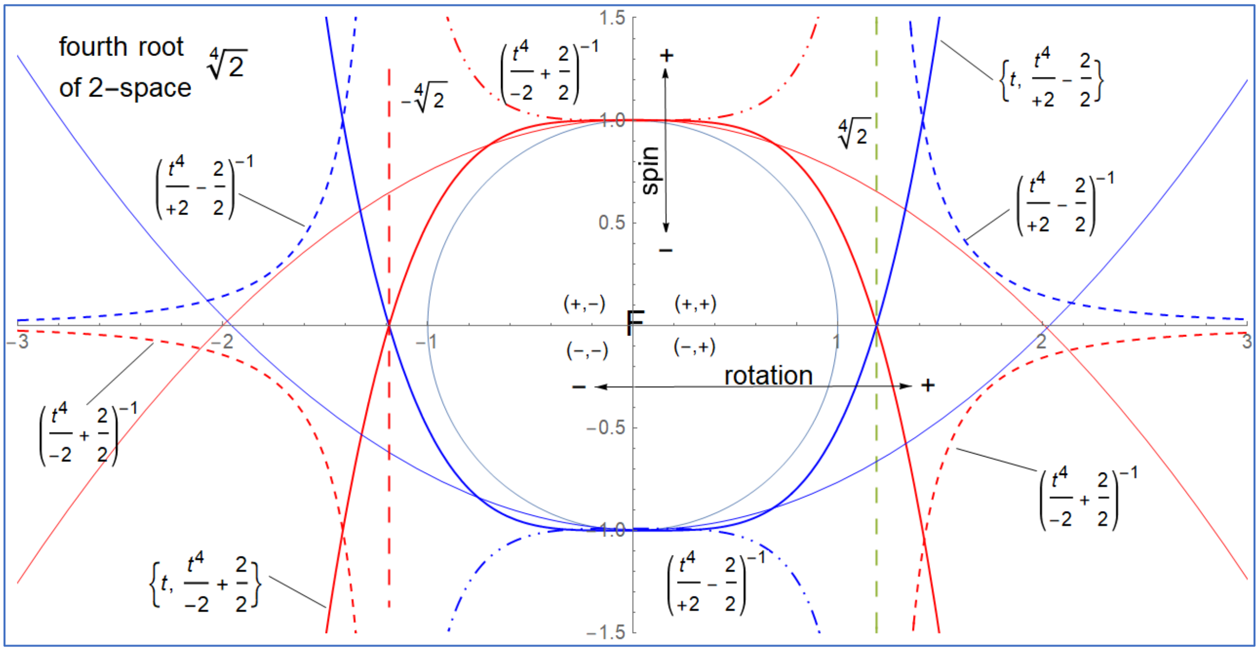


Figure 31: CSDA curved space construction of degree 4 root on central force rotation magnitude. (space roots.nb)

I find no conclusive evidence that time is the 4th dimensional creature we suspect it to be. At least not in our mathematical (exponent) sense. I lay out degree of exponent, as described by Gauss, quantifying a numerical solution for roots.

Degree 1. Linear space. No exponents greater than 1 will return 1 solution.

Degree 2. The first space curve, pretty much explored by Galileo and Calculus of Leibniz and Sir Isaac. No exponents greater than 2 will return 2 solution.

Degree 3. Cubic 3-dimensional space. Up, down, and around. Spin rotation geometry of a **CSDA**. No exponents greater than 3 will return 3 solution.

Degree 4. Just another exponent.

As to time being the 4th dimension, dimension of what? We know time is an operator, a collection of frames, how many how fast? A mouse dancing on a pad? A bullet shearing a playing card length wise?

I say let time operate as a concept member of the word continuum, a complicated concept.

TIME & DEGREE EXPONENT

Degree 1. Sir Isaac's 1st law. A ball bearing set in motion will travel a straight line till stopped by time.

Degree 2. Galileo found that things fall with change of space per unit time dependent on central force G-field acceleration. Terminal velocity tells us how much time to impact.

Degree 3. 3 space motion vectors of Frenet. (v) tangent normal to orbit curve; (a) acceleration force connecting M_2 with M_1. And torque; changing 3-space orbit curves by altering velocity with changing acceleration per unit time.

Degree 4. (?)

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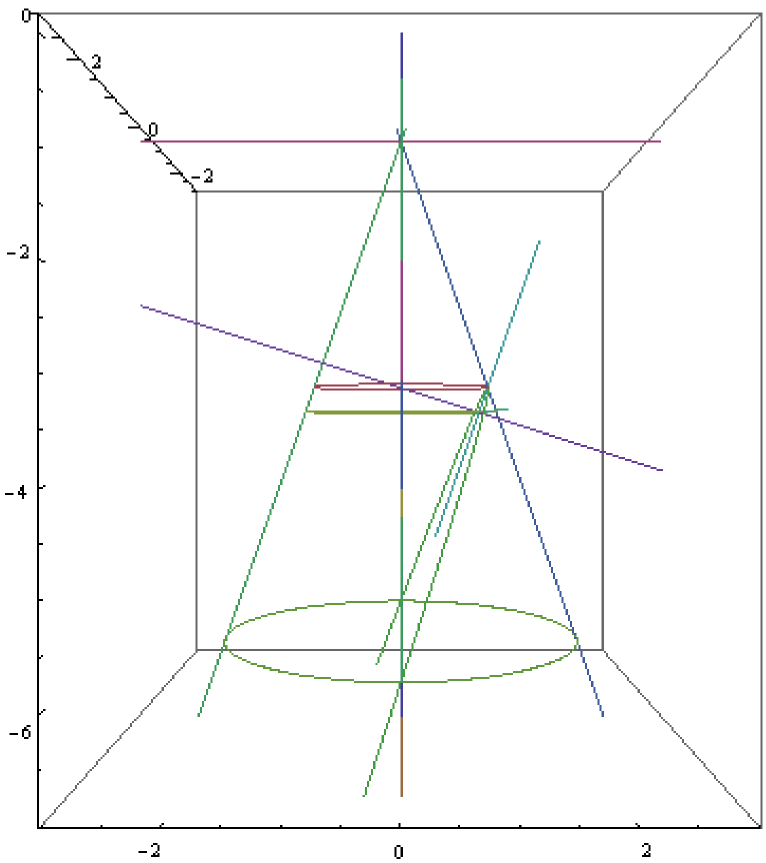
Sand Box Geometry LLC, a company dedicated to utility of Ancient Greek Geometry in pursuing exploration and discovery of Central Force Field Curves.

Using computer parametric geometry code to construct the focus of an Apollonian parabola section within a right cone.

"It is remarkable that the directrix does not appear at all in Apollonius great treatise on conics. The focal properties of the central conics are given by Apollonius, but the foci are obtained in a different way, without any reference to the directrix; the focus of the parabola does not appear at all... Sir Thomas Heath: "A HISTORY OF GREEK MATHEMATICS" page 119, book II.



Utility of a Unit Circle and Construct Function Unit Parabola may not be used without written permission of my publishing company

The computer is my sandbox, the unit circle my compass, and the focal radius of the unit parabola my straight edge.

ALΣXANDΣR; CEO SAND BOX GEOMETRY LLC

The square space hypotenuse of Pythagoras is the secant connecting (π/2) spin radius (0, 1) with accretion point (2, 0). I will use the curved space hypotenuse, also connecting spin radius (π/2) with accretion point (2, 0), to analyze g-field energy curves when we explore changing acceleration phenomena.

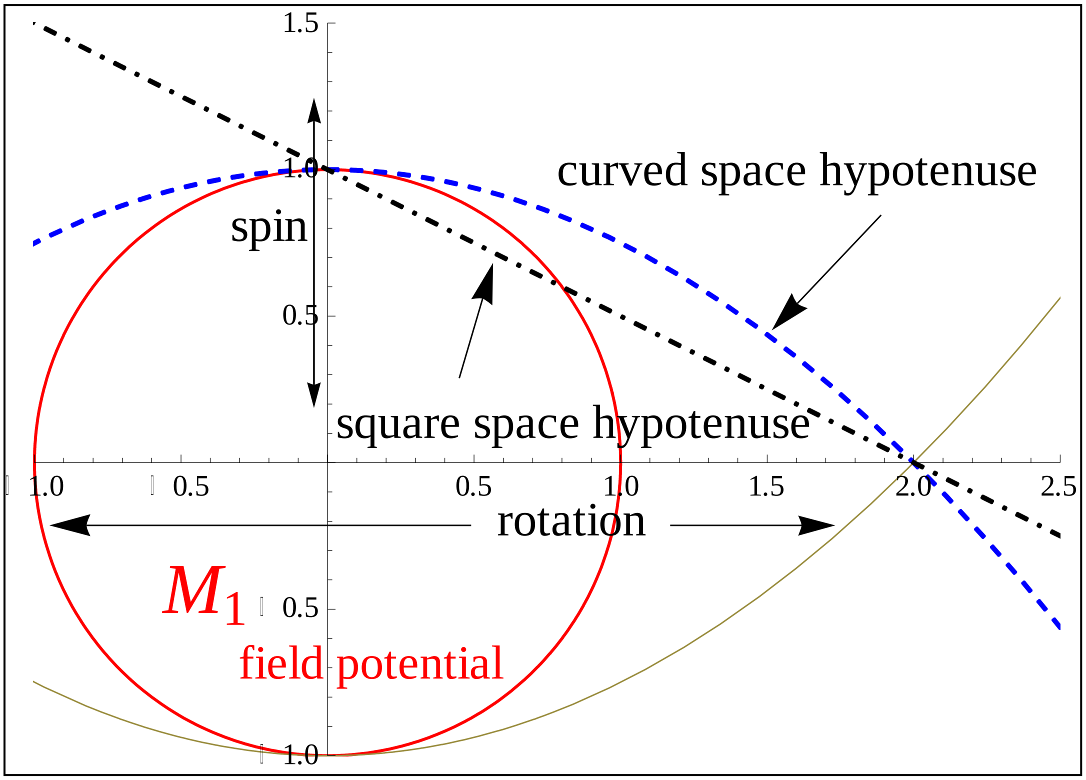


Figure 32: CSDA demonstration of a curved space hypotenuse and a square space hypotenuse together.

We have two curved space hypotenuses because the gravity field is a symmetrical central force, and will have an energy curve at the **N** pole and one at the **S** pole of spin; just as a bar magnet. When exploring changing acceleration energy curves of M_2 orbits, we will use the N curve as our planet group approaches high energy perihelion on the north time/energy curve.

ALΣXANDΣR