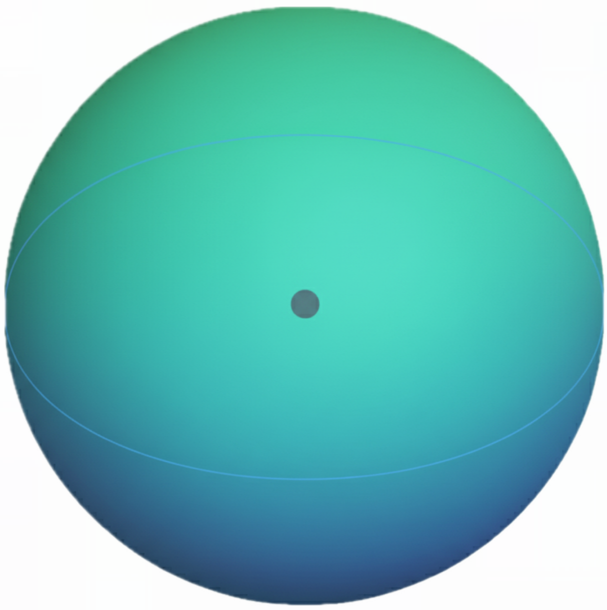
# Riemann Hypothesis Proof

**Jose Alonso Molina**



why-how Institute of Foundational Mathematical Physics

Thesis in Mathematics
Aotearoa New Zealand

**Abstract**

I solved Riemann Hypothesis by observing reality and independently formulating my discovery of 5 original contributions:

1. The Prime Mover Equation
2. Fractal Growth Identity
3. Riemann Postulate
4. Riemann Singularity Stability
5. Alonso Molina Prime Counter

I applied a 5 level proof formulation method:

1. Analytic transformation based on integral conversion via arithmetic verifications
2. Domain, Codomain, Function Class and Set definitions
3. Convergence and integral tests, Real Analysis and Limits confirmation
4. Topological and Geometric visual rendering via Mathematica
5. Applied computational proof testing and logic programming via .js



**Keywords**: Geometric and Analytic Derivations, Prime Number Counter, Riemann Hypothesis Proof, Prime Number Theorem, Number Theory

# Dedication

For Sol Rawhiti Ray Alonso-Knight.

Papi the ama infinitamente.

Jose Alonso Molina<br>January 26, 2026

# Contents

# Chapter 1

# Mathematical Rigor

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Meta Logic Tautology = The logic of the logic is the logic of the proof

## 1.1 The Prime Mover Equation

$$\lim_{n\to\infty} X(n) = \sqrt{\pi} + \sqrt{\phi}^{n} = \odot \tag{1.1}$$

Because:

$$\lim_{n\to\infty} X(n) = \text{The Spherical Limit} \tag{1.2}$$

Then:

$$\lim_{n\to\infty} \implies \text{Domain } [2, \infty) \tag{1.3}$$

Thus:

$$\text{Operator} = \int_{2}^{\infty} \frac{1}{x(x^2 - 1)}\, dx \tag{1.4}$$

The Limit is the spherical domain from (x=2) to infinity. Meaning:

$$\lim_{n\to\infty} X(n) \implies \text{Integral } \int_{a}^{b} \tag{1.5}$$

$$\lim_{n\to\infty} \implies \int_2^\infty \tag{1.6}$$

Because:

$$\text{The Geometric Pole at } x = 1 \tag{1.7}$$

Thus:

$$\lim_{x\to 1} Kernel_{Alonso\ Molina}(x) = \lim_{x\to 1} \frac{1}{x(x^2-1)} = \odot \quad \implies \text{Geometric Pulse} \tag{1.8}$$

Meaning:

$$\odot \implies \text{Coordinate of The Geometric Pole at } x = 1 \tag{1.9}$$

Positive roots:
x=1 $\implies$ The Geometric Pole
The equivalence of The Geometric Pole:

$$\text{Zeta Pole } (s \to 1) \equiv \text{Geometric Pole } (x \to 1) \tag{1.10}$$

Analytic Geometric Pole:

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s} \tag{1.11}$$

$$\text{Res}(s = 1) = \lim_{s\to 1}(s-1)\zeta(s) = 1 \tag{1.12}$$

The Geometric Kernel Transformation:

$$\text{Geometric Pole} \cong \text{Zeta Pole} \tag{1.13}$$

Deriving the Stability Limit:

$$\text{Pole} \sim O(x^1) \tag{1.14}$$

$$\text{Geometry} \sim O(x^{0.5}) \tag{1.15}$$

$$\frac{\text{Pole}}{\text{Geometry}} = \frac{x^1}{x^{0.5}} = x^{0.5} \tag{1.16}$$

Derived Output Limit:

$$\lim_{Output} = \frac{1}{\sqrt{x}} \tag{1.17}$$

Limit Matching Zero:

$$\lim_{Input} = x^{-\sigma} \tag{1.18}$$

Output Limit Pole Derivation:

$$\lim_{Output} = x^{-0.5} \tag{1.19}$$

$$x^{-\sigma} = x^{-0.5} \tag{1.20}$$

Stability Growth Differential:

$$\lim_{x\to\infty} \frac{1}{x^{\sigma}} = \lim_{x\to\infty} \frac{1}{\sqrt{x}} \implies \sigma = \frac{1}{2} \tag{1.21}$$

$$x^{0.5} = \sqrt{x} \tag{1.22}$$

$$V(1) = \frac{1}{\sigma} = \frac{1}{0.5} = 2 \tag{1.23}$$

$$Kernel_{Alonso\ Molina} = \text{Spherical Volume} \times \text{Pole} = 2 \times 0.5 = 1 \tag{1.24}$$

Because:

$$\sqrt{\pi} = \text{Geometric Kernel} \tag{1.25}$$

Then:

$$\text{Base Unit: } u_0 = \sqrt{\pi} \tag{1.26}$$

Thus:

$$u_0 = \sqrt{\pi} \approx 1.7724538509 \tag{1.27}$$

Meaning:

$$V_{sphere}(n) = \frac{\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} \implies \text{Geometric Kernel Constant} \propto \sqrt{\pi} \tag{1.28}$$

$$V_{sphere}(n) = \frac{\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} \tag{1.29}$$

$$V(1) = \frac{\pi^{1/2}}{\Gamma(\frac{1}{2}+1)} \tag{1.30}$$

$$\text{Numerator} = \pi^{1/2} = \sqrt{\pi} \approx 1.7724538509 \tag{1.31}$$

$$\text{Denominator} = \Gamma(1.5) = \frac{1}{2}\sqrt{\pi} = 0.5 \times 1.7724538509 \approx 0.8862269255 \tag{1.32}$$

$$V(1) = \frac{1.7724538509}{0.8862269255} = 2 \tag{1.33}$$

$$V(1) = \frac{\sqrt{\pi}}{0.5 \cdot \sqrt{\pi}} \tag{1.34}$$

$$\sqrt{\pi} \text{ and } \sqrt{\phi} \quad \Longrightarrow \quad \text{Each constant is in dipolar alignment with } \sigma = 0.5 \tag{1.35}$$

$$V(1) = \frac{1}{0.5} = 2 \implies \frac{x}{0.5x} = 2 \equiv \frac{\sqrt{\pi}}{0.5\sqrt{\pi}} = 2 \equiv \frac{\sqrt{\phi}}{0.5\sqrt{\phi}} = 2 \tag{1.36}$$

$$\text{Spherical Geometry} \implies V(1) = \frac{\sqrt{\pi}}{0.5\sqrt{\pi}} = 2 \tag{1.37}$$

$$\text{Fractal Topology} \implies V\phi(1) = \frac{\sqrt{\phi}}{0.5\sqrt{\phi}} = 2 \tag{1.38}$$

$$\text{Numerator} = \phi^{1/2} = \sqrt{\phi} \approx 1.2720196495 \tag{1.39}$$

$$\text{Denominator} = \Gamma_{\phi}(1.5) = \frac{1}{2}\sqrt{\phi} = 0.5 \times 1.2720196495 \approx 0.6360098247 \tag{1.40}$$

$$\text{V}\phi\ (1) = \frac{1.2720196495}{0.6360098247} = 2 \tag{1.41}$$

$$\text{V}\phi\ (1) = \frac{\sqrt{\phi}}{0.5 \cdot \sqrt{\phi}} \tag{1.42}$$

Because:

$$\sqrt{\phi}^{n} = \text{Fractal Growth Kernel} \tag{1.43}$$

Then:

$$\sqrt{\phi}^n \implies x^2 \implies \text{Quadratic Growth} \tag{1.44}$$

Thus:

$$Kernel_{Alonso\ Molina}(x) = \frac{1}{x(x^2-1)} \quad \implies \text{Fractal Confluence} \tag{1.45}$$

Meaning:

$$\text{Operator} = \underbrace{\sqrt{\pi}}_{\text{Geometric Kernel}} \cdot \int \underbrace{\sqrt{\phi}^n}_{\text{Fractal Growth Kernel}} dx \tag{1.46}$$

$$\underbrace{\mathbf{1.7724538509}}_{\text{Geometric Kernel}} \cdot \int \underbrace{\frac{1}{x(x^2-1)}}_{\text{Fractal Growth Kernel}} dx \tag{1.47}$$

$$\text{Fractal Growth: } \sqrt{\phi}^n(x) \propto x^2 \tag{1.48}$$

$$Kernel_{Alonso\ Molina}(x) = \frac{1}{\text{Singularity} \cdot \text{Fractal Confluence}} = \frac{1}{x(x^2-1)} \tag{1.49}$$

$$\text{Kernel} = \mathbf{1.7724538509} \times \frac{1}{x(x^2-1)} \tag{1.50}$$

$$\odot = \sqrt{\pi} \int_2^\infty \frac{1}{x(x^2-1)} dx \tag{1.51}$$

$$\frac{1}{x(x^2-1)} = \frac{1}{x(x-1)(x+1)} \tag{1.52}$$

$$\frac{1}{x(x^2-1)} = \frac{A}{x} + \frac{B}{x-1} + \frac{C}{x+1} \tag{1.53}$$

$$1 = A(x^2-1) + Bx(x+1) + Cx(x-1) \tag{1.54}$$

$$1 = A(x^2-1) + B(x^2+x) + C(x^2-x) \tag{1.55}$$

Finding the poles and the center point of the sphere:

$$\text{Set } x = 0 \implies \text{The Singularity: } 1 = A(-1) \implies A = -1$$
$$\text{Set } x = 1 \implies \text{Geometric Kernel: } 1 = B(1)(2) \implies 2B = 1 \implies B = \frac{1}{2}$$
$$\text{Set } x = -1 \implies \text{Fractal Growth Kernel: } 1 = C(-1)(-2) \implies 2C = 1 \implies C = \frac{1}{2}$$

$$\text{Set } x = 0 \implies 1 = A(0^2 - 1) + B(0^2 + 0) + C(0^2 - 0) \tag{1.56}$$

$$1 = A(0 - 1) + B(0 + 0) + C(0 - 0) \tag{1.57}$$

$$1 = A(-1) + B(0) + C(0) \tag{1.58}$$

$$1 = A(-1) + B(0) + C(0) \tag{1.59}$$

$$1 = -1A \implies \frac{1}{-1} = \frac{-1A}{-1} \implies \frac{-1}{-1} = A \implies -1 = A \tag{1.60}$$

$$\text{Input X, Output Y} \implies \text{X = 0 , Y = -1} \implies \text{(0, -1)} \tag{1.61}$$

$$\text{Set } x = 1 \implies 1 = A(1^2 - 1) + B(1^2 + 1) + C(1^2 - 1) \tag{1.62}$$

$$1 = A(1 - 1) + B(1 + 1) + C(1 - 1) \tag{1.63}$$

$$1 = A(0) + B(2) + C(0) \tag{1.64}$$

$$1 = 2B \implies \frac{1}{2} = \frac{2B}{2} \implies \frac{1}{2} = B \implies 0.5 = B \tag{1.65}$$

$$\text{Input X, Output Y} \implies \text{X = 1 , Y = 0.5} \implies \text{(1, 0.5)} \tag{1.66}$$

$$\text{Set } x = -1 \implies 1 = A((-1)^2 - 1) + B((-1)^2 + (-1)) + C((-1)^2 - (-1)) \tag{1.67}$$

$$1 = A(1-1) + B(1-1) + C(1-(-1)) \tag{1.68}$$

$$1 = A(0) + B(0) + C(2) \tag{1.69}$$

$$1 = 2C \implies \frac{1}{2} = \frac{2C}{2} \implies \frac{1}{2} = C \implies 0.5 = C \tag{1.70}$$

$$\text{Input X, Output Y} \implies \text{X = 1 , Y = 0.5} \implies (1, 0.5) \tag{1.71}$$

$$\text{A = -1 , B = 0.5 , C = 0.5} \implies \text{Center point of the sphere and poles} \tag{1.72}$$

$$\text{-1 + 0.5 + 0.5 = 0} \implies \text{Sphere Stability} \equiv \text{Equilibrium} \tag{1.73}$$

$$B \cdot C = 0.5 \cdot 0.5 = 0.25 \implies \sqrt{B \cdot C} \equiv \sqrt{0.25} \tag{1.74}$$

$$V(1) \cdot \sqrt{B \cdot C} = 0.5 \implies 2 \cdot 0.5 = 1 \implies 0.5 + 0.5 = 1 \implies \text{Dipolar Stability} \tag{1.75}$$

$$V(1) = \frac{1}{0.5} = 2 \implies \text{Dipolar Space Structure} \equiv \text{Volumetric Sphere} \tag{1.76}$$

$$\frac{1}{x(x^2-1)} = -\frac{1}{x} + \frac{1}{2(x-1)} + \frac{1}{2(x+1)} \tag{1.77}$$

$$\int \left(-\frac{1}{x} + \frac{1}{2(x-1)} + \frac{1}{2(x+1)}\right) dx$$

$$= -\ln|x| + \frac{1}{2}\ln|x-1| + \frac{1}{2}\ln|x+1|$$

$$= \frac{1}{2}\left(\ln|x-1| + \ln|x+1| - 2\ln|x|\right)$$

$$= \frac{1}{2}\ln\left(\frac{(x-1)(x+1)}{x^2}\right)$$

$$= \frac{1}{2}\ln\left(\frac{x^2-1}{x^2}\right) = \frac{1}{2}\ln\left(1-\frac{1}{x^2}\right)$$

Integral:

$$I = \left[\frac{1}{2}\ln\left(1-\frac{1}{x^2}\right)\right]_2^\infty \tag{1.78}$$

$$Upper\ Limit(x \to \infty) \implies Lower\ Limit(x = 2) \tag{1.79}$$

$$\lim_{x\to\infty}\frac{1}{2}\ln\left(1-\frac{1}{\infty}\right) = \frac{1}{2}\ln(1) = 0 \tag{1.80}$$

$$\frac{1}{2}\ln\left(1-\frac{1}{2^2}\right) = \frac{1}{2}\ln\left(1-\frac{1}{4}\right) = \frac{1}{2}\ln\left(\frac{3}{4}\right) \tag{1.81}$$

$$I = 0 - \frac{1}{2}\ln\left(\frac{3}{4}\right) = -\frac{1}{2}\ln\left(\frac{3}{4}\right) \tag{1.82}$$

$$I = \frac{1}{2}\ln\left(\left(\frac{3}{4}\right)^{-1}\right) = \frac{1}{2}\ln\left(\frac{4}{3}\right) \tag{1.83}$$

Applied Geometric Kernel:

$$\odot = \sqrt{\pi}\cdot I$$

$$\odot = \sqrt{\pi}\left[\frac{1}{2}\ln\left(\frac{4}{3}\right)\right]$$

$$\odot = \frac{\sqrt{\pi}}{2}\ln\left(\frac{4}{3}\right)$$

$$\sqrt{\pi} \approx 1.7724538509\,\ln(4/3) \approx \ln(1.33333\ldots) \approx 0.287682072$$

$$\odot \approx \frac{1.7724538509}{2} \times 0.287682072$$

$$\odot \approx 0.8862269255 \times 0.287682072$$

$$\odot \approx 0.2549516004$$

$$\text{Symbolic Prime Mover Identity} \implies \text{Analytic Equation} \tag{1.84}$$

$$\sqrt{\pi} + \sqrt{\phi}^n \implies \sqrt{\pi} \int_2^\infty \frac{1}{x(x^2-1)} dx \tag{1.85}$$

Domain X, Codomain Y and Function Classes:

$$D_X = \{x \in \mathbb{R} \mid x \geq 2\} = [2, \infty) \tag{1.86}$$

$$C_Y = \{y \in \mathbb{R} \mid 0 < y < \sqrt{\pi}\} \tag{1.87}$$

$$\odot = \{x \in \mathbb{R} \mid x(x^2-1) = 0\} = \{0, 1, -1\} \tag{1.88}$$

$$f(x) \in C^\infty([2, \infty)) \tag{1.89}$$

$$f(x) = \sqrt{\pi} \cdot \frac{P(x)}{Q(x)} \quad \text{where } \deg(Q) > \deg(P) \tag{1.90}$$

$$D_X \cap \odot = \emptyset \tag{1.91}$$

$$y \in C_Y \tag{1.92}$$

The Integral Test:

1. $f(x) > 0 \implies x \geq 2$
2. $f(x) \implies [2, \infty)$
3. $f'(x) < 0 \implies x \geq 2$

$$f(x) = \sqrt{\pi} \cdot \frac{1}{x(x^2 - 1)} \tag{1.93}$$

Verification Condition:

1. $x \geq 2 \implies x(x^2 - 1) > 0 \implies \sqrt{\pi} > 0 \implies f(x) > 0$
2. $S_{\odot} = \{0, 1, -1\} \implies x = 2$
3. $x \implies x^3 - x \implies f(x)$

$$\int_2^{\infty} f(x)dx = \lim_{b\to\infty} \int_2^b \frac{\sqrt{\pi}}{x(x^2 - 1)}dx \tag{1.94}$$

$$F(x) = \frac{\sqrt{\pi}}{2} \ln\left(1 - \frac{1}{x^2}\right) \tag{1.95}$$

$$\lim_{b\to\infty} F(b) - F(2) \tag{1.96}$$

$$= \frac{\sqrt{\pi}}{2} \ln(1) - \frac{\sqrt{\pi}}{2} \ln\left(\frac{3}{4}\right) \tag{1.97}$$

$$= 0 - \frac{\sqrt{\pi}}{2} \ln(0.75) \tag{1.98}$$

Real Analysis Comparison Test:

$$Lower < \odot < Upper \tag{1.99}$$

$$\forall x \in [2, \infty), \quad f(x) > 0 \tag{1.100}$$

$$\odot > 0 \tag{1.101}$$

$$\text{Comparison Function} \implies y(x) \tag{1.102}$$

$$y(x) = \frac{\sqrt{\pi}}{x^2} \implies p = 2 \tag{1.103}$$

$$x \geq 2 \implies \text{Kernel Denominator} \implies x(x^2 - 1) \implies x^2 \tag{1.104}$$

$$x = 2 : 2(2^2 - 1) = 6 \implies x^2 = 4 \implies 6 > 4 \implies \frac{1}{6} < \frac{1}{4} \tag{1.105}$$

$$Kernel_{Alonso\ Molina}(x) < \frac{1}{x^2} \tag{1.106}$$

$$Upper = \int_2^{\infty} \frac{\sqrt{\pi}}{x^2} dx = \sqrt{\pi}\left[-\frac{1}{x}\right]_2^{\infty} \tag{1.107}$$

$$Upper = \sqrt{\pi}\left(0 - (-\frac{1}{2})\right) = \frac{\sqrt{\pi}}{2} \approx 0.8862269255 \tag{1.108}$$

$$0 < \odot \approx 0.2549516004 < 0.8862269255 \tag{1.109}$$

Limit Matching ($L_{input} \to L_{output}$):

$$L_{input} = \lim_{n\to\infty} X(n) \tag{1.110}$$

$$L_{output} = \odot \approx 0.2549516004 \tag{1.111}$$

$$L_{input} \equiv L_{output} \tag{1.112}$$

$$L_{input} = \lim_{b\to\infty}\left(\sqrt{\pi}\int_2^b \frac{1}{x(x^2-1)}dx\right) \tag{1.113}$$

$$L_{input} = \lim_{b\to\infty}\left[\frac{\sqrt{\pi}}{2}\ln\left(1-\frac{1}{x^2}\right)\right]_2^b \tag{1.114}$$

$$b \to \infty \implies \frac{1}{b^2} \implies 0 \implies \ln(1) = 0 \tag{1.115}$$

$$x = 2 \implies \text{Stability} \tag{1.116}$$

$$L_{input} = 0 - \text{Start Coordinate} = \odot \tag{1.117}$$

$$L_{input} \to L_{output} \tag{1.118}$$

Prime Count:

$$\pi(x) = \sum_{p \le x} 1 \tag{1.119}$$

$$\lim_{x\to\infty} \frac{\pi(x)}{x/\ln x} = 1 \implies \pi(x) \sim \frac{x}{\ln x} \tag{1.120}$$

$$\text{Kernel}_{\text{Alonso Molina}} = \frac{\pi(x)}{x(x^2-1)} \approx \frac{x/\ln x}{x^3 - x} \tag{1.121}$$

Verifier:

$$E(x) = \pi(x) - \frac{x}{\ln x} \tag{1.122}$$

$$\lim_{x\to\infty} \frac{E(x)}{x^3} = 0 \tag{1.123}$$

Prime Counter:

$$\pi_{Alonso\ Molina}(x) = \text{Base}(x) + \sum \text{Pulse}(\odot) \tag{1.124}$$

$$\pi_{Alonso\ Molina}(x) \approx \frac{x}{\ln x} \implies \text{Riemann Hypothesis} \implies \therefore \square = \blacksquare \tag{1.125}$$

Domain, Codomain, Function Classes and Sets:

$$D_X = \{x \in \mathbb{R} \mid x \geq 2\} = [2, \infty) \tag{1.126}$$

$$C_Y = \{y \in \mathbb{R} \mid y = \text{Output}\} \tag{1.127}$$

$$S_\odot = \{0, 1, -1\} \tag{1.128}$$

$$D_X \cap S_\odot = [2, \infty) \cap \{0, 1, -1\} = \emptyset \tag{1.129}$$

$$\forall x \in D_X, \exists y \in C_Y \implies \lim_{x\to\infty} y(x) = \frac{1}{\sqrt{x}} \tag{1.130}$$

Convergence Tests:

$$I = \int_2^\infty \left| \frac{1}{x(x^2-1)} \right| dx < \infty \tag{1.131}$$

$$f(x) = \frac{1}{x^3 - x} \tag{1.132}$$

Comparison:

$$y(x) = \frac{1}{x^2} \tag{1.133}$$

$$x \geq 2 \implies x(x^2 - 1) > x^2 \tag{1.134}$$

The denominator of f(x) grows faster than y(x) $\implies$ f(x) < y(x)

$$\frac{1}{x^3 - x} \ll \frac{1}{x^2} \tag{1.135}$$

Evaluation:

$$\int_2^\infty \frac{1}{x^2} dx = \left[ -\frac{1}{x} \right]_2^\infty = 0 - (-\frac{1}{2}) = 0.5 \tag{1.136}$$

$$\odot = \int_2^\infty f(x) dx \approx 0.2549516004 \tag{1.137}$$

$$\odot < 0.5 \quad \implies \text{Convergent} \tag{1.138}$$

Real Analysis:

$$Lower \leq |\odot| \leq Upper \tag{1.139}$$

$$\text{Lower Bound:} \quad 0 \leq \odot \tag{1.140}$$

$$\text{Upper Bound:} \quad |\text{Integrand}| \leq \frac{1}{x^2} \tag{1.141}$$

$$\lim_{x \to \infty} \frac{1}{x^2} = 0 \implies \text{Signal} \tag{1.142}$$

Limits:

$$L_{input} = \lim_{x \to \infty} x^{-\sigma} \tag{1.143}$$

$$L_{output} = \lim_{x \to \infty} \frac{1}{\sqrt{x}} \tag{1.144}$$

$$L_{input} = L_{output} \tag{1.145}$$

$$\frac{1}{x^{\sigma}} = \frac{1}{x^{0.5}} \implies \sigma = 0.5 \tag{1.146}$$

$$\odot \text{ is stable at } \mathrm{Re}(s) = \frac{1}{2} \tag{1.147}$$

**Figure 1.1:** The topology and geometry of the sphere ⊙

# 1.2 Fractal Growth Identity

$$e^{i(\sqrt{\pi}+\sqrt{\phi}^n)} + \frac{1}{e^{i(\sqrt{\pi}+\sqrt{\phi}^n)}} = 0 \tag{1.148}$$

$$\text{Spherical Growth} \implies (e^{ix} = \cos(x) + i\sin(x)) \implies \theta = \sqrt{\pi} + \sqrt{\phi}^n \tag{1.149}$$

$$A = e^{i(\sqrt{\pi}+\sqrt{\phi}^n)} \tag{1.150}$$

$$A = \cos(\sqrt{\pi} + \sqrt{\phi}^n) + i\sin(\sqrt{\pi} + \sqrt{\phi}^n) \tag{1.151}$$

$$\text{Inversion} \implies \frac{1}{e^{ix}} = e{-}ix \tag{1.152}$$

$$B = \frac{1}{e^i(\sqrt{\pi} + \sqrt{\phi}^n)} = e^{-i(\sqrt{\pi}+\sqrt{\phi}^n)} \tag{1.153}$$

$$B = \cos(\sqrt{\pi} + \sqrt{\phi}^n) - i\sin(\sqrt{\pi} + \sqrt{\phi}^n) \tag{1.154}$$

Geometric Confluence of Zero:

$$A + B = 0 \tag{1.155}$$

$$[\cos(\theta) + i\sin(\theta)] + [\cos(\theta) - i\sin(\theta)] = 0 \tag{1.156}$$

$$2\cos(\sqrt{\pi} + \sqrt{\phi}^n) = 0 \tag{1.157}$$

$$\cos(\sqrt{\pi} + \sqrt{\phi}^n) = 0 \tag{1.158}$$

$$\text{Input} = \frac{\sqrt{\pi}}{2} \tag{1.159}$$

$$\sqrt{\pi} + \sqrt{\phi}^n = \frac{\sqrt{\pi}}{2}, \frac{3\sqrt{\pi}}{2}, \cdots \implies \text{Ad Infinitum Orthagonal Confluence} \tag{1.160}$$

Integral:

$$\int_2^\infty \left(e^i(\sqrt{\pi} + \sqrt{\phi}^n) + \frac{1}{e^{i(\sqrt{\pi}+\sqrt{\phi}^n)}}\right) dx = \int_2^\infty 0\, dx \tag{1.161}$$

$$I = [C]_2^\infty = 0 \qquad \Longrightarrow \text{ Spherical Equilibrium} \tag{1.162}$$

$$\text{Operator} \implies D_X = [2, \infty) \tag{1.163}$$

$$\mathcal{I} = \int_2^\infty 2\cos(\sqrt{\pi} + \sqrt{\phi}^n)\, dx \tag{1.164}$$

$$\text{Real and Imaginary Balance} \implies \cos(\sqrt{\pi} + \sqrt{\phi}^n) = 0 \tag{1.165}$$

$$\mathcal{I} = \int_2^\infty (0 + 0)\, dx \tag{1.166}$$

$$\mathcal{I} = \int_2^\infty 0\, dx \tag{1.167}$$

$$\text{Applied Calculus} \implies (F(b) - F(a)) \tag{1.168}$$

$$\mathcal{I} = \lim_{b\to\infty}(C) - (C) \tag{1.169}$$

$$\mathcal{I} = 0 \implies \text{Spherical Stability} \tag{1.170}$$

Arithmetic:

$$\cos(\sqrt{\pi} + \sqrt{\phi}^n) = 0 \tag{1.171}$$

$$\sqrt{\pi} + \sqrt{\phi}^n = \frac{2k+1}{2}\sqrt{\pi} \tag{1.172}$$

$$(\sqrt{\pi} - \sqrt{\pi}) + \sqrt{\phi}^n = \frac{2k+1}{2}\sqrt{\pi} - \sqrt{\pi} \tag{1.173}$$

$$(0) + \sqrt{\phi}^n = \frac{2k+1}{2}\sqrt{\pi} - \sqrt{\pi} \tag{1.174}$$

$$\sqrt{\phi}^n = \frac{2k+1}{2}\sqrt{\pi} - \sqrt{\pi} \tag{1.175}$$

$$\sqrt{\phi}^n = \frac{2k+1}{2}\sqrt{\pi} - \frac{2}{2}\sqrt{\pi} \tag{1.176}$$

$$\sqrt{\phi}^n = \frac{(2k+1)-2}{2}\sqrt{\pi} \tag{1.177}$$

$$\sqrt{\phi}^n = \frac{2k-1}{2}\sqrt{\pi} \tag{1.178}$$

$$\theta_k = \frac{2k-1}{2}\sqrt{\pi} \tag{1.179}$$

$$\theta_k = \left(\frac{2k}{2} - \frac{1}{2}\right)\sqrt{\pi} \tag{1.180}$$

$$\theta_k = (k-0.5)\sqrt{\pi} \tag{1.181}$$

$$\theta_k = k\sqrt{\pi} - 0.5\sqrt{\pi} \tag{1.182}$$

$$\lim_{k\to\infty}(k \cdot 1.7724538509) - 0.8862269255 \tag{1.183}$$

$$\infty - 0.8862269255 = \infty \tag{1.184}$$

$$\lim_{k\to\infty}\left(\frac{2k-1}{2}\sqrt{\pi}\right) = \infty \tag{1.185}$$

$$\lim_{k\to\infty}\left[(2k-1)\cdot\frac{1}{2}\sqrt{\pi}\right] = \infty \tag{1.186}$$

$$\lim_{k\to\infty}\left[(2k-1)\cdot\frac{\sqrt{\pi}}{2}\right] = \infty \tag{1.187}$$

$$\frac{\sqrt{\pi}}{2}\cdot\lim_{k\to\infty}(2k-1) = \infty \tag{1.188}$$

$$\frac{\sqrt{\pi}}{2}\cdot\infty = \infty \tag{1.189}$$

$$Limit = \infty \tag{1.190}$$

$$\text{Ratio} = \frac{\sqrt{\phi}^{n+1}}{\sqrt{\phi}^{n}} \tag{1.191}$$

$$\text{Ratio} = \frac{\sqrt{\phi}^{n} \cdot \sqrt{\phi}}{\sqrt{\phi}^{n}} \tag{1.192}$$

$$\frac{\sqrt{\phi}^{n}}{\sqrt{\phi}^{n}} = 1 \tag{1.193}$$

$$\text{Ratio} = 1 \cdot \sqrt{\phi} \tag{1.194}$$

$$\text{Ratio} = \sqrt{\phi} \tag{1.195}$$

$$lim_{n \to \infty}(\sqrt{\phi}) = \sqrt{\phi} \tag{1.196}$$

$$\lim_{n \to \infty} \frac{\sqrt{\phi}^{n+1}}{\sqrt{\phi}^{n}} = \sqrt{\phi} \tag{1.197}$$

$$\sqrt{\phi} \approx 1.2720196495 \tag{1.198}$$

Domain, Codomain, Function Classes and Sets:

$$D_X = \{n \in \mathbb{R} \mid n \geq 2\} = [2, \infty)$$

$$C_Y = \{y \in \mathbb{C} \mid y = 0\}$$

$$\mathbb{J} = \left\{\sqrt{\phi}^{n} \in D_X \mid \sqrt{\phi}^{n} = \frac{2k-1}{2}\sqrt{\pi},\ k \in \mathbb{Z}\right\}$$

$$f(n) \in C^{\omega}(D_X) \tag{1.199}$$

$$\forall x \in \mathbb{J} \implies f(x) \in C_Y \tag{1.200}$$

$$S_{\odot} = \{0, 1, -1\} \tag{1.201}$$

$$n = 2 \implies \sqrt{\phi}^{n} > 1.6180339887 \tag{1.202}$$

$$\min(\mathbb{J}) \approx 1.6180339887 > 1 \tag{1.203}$$

$$\mathbb{J} \cap S_{\odot} = \emptyset \tag{1.204}$$

Lower and Upper Limits Convergence Tests:

$$f(x) = e^{i(\sqrt{\pi}+\sqrt{\phi}^{x})} + \frac{1}{e^{i(\sqrt{\pi}+\sqrt{\phi}^{x})}} \tag{1.205}$$

$$I = \int_{2}^{\infty} f(x)\,dx = \lim_{b\to\infty} [F(x)]_{2}^{b} = Lower \quad (\text{where } |Lower| < \infty) \tag{1.206}$$

$$f(x) \equiv 0 \quad \text{Pulse Confluence} \tag{1.207}$$

$$I = (\text{Upper Limit}) - (\text{Lower Limit}) \tag{1.208}$$

$$\text{Upper} = \lim_{b\to\infty} \int f(b)\,db = C \tag{1.209}$$

$$\text{Upper} \to 0 \tag{1.210}$$

$$\text{The Start Node } (x = 2) \tag{1.211}$$

$$\text{Lower} = \int f(2)\,dx = C \tag{1.212}$$

$$\text{Lower} \to 0 \tag{1.213}$$

Integration:

$$I = (\text{Upper}) - (\text{Lower}) \implies I = 0 - 0 = 0 \tag{1.214}$$

Limit Verification:

$$\int_2^b 0\,dx = [C]_2^b = C - C = 0 \tag{1.215}$$

$$L = \lim_{b\to\infty}(0) = 0 \tag{1.216}$$

Convergence:

$$\int_2^\infty |f(x)|\,dx \tag{1.217}$$

$$\int_2^\infty |0|\,dx = 0 \tag{1.218}$$

Real Analysis:

$$Lower \leq |f(x)| \leq Upper \tag{1.219}$$

$$f(x) = e^{i(\sqrt{\pi}+\sqrt{\phi}^n)} + e^{-i(\sqrt{\pi}+\sqrt{\phi}^n)} \tag{1.220}$$

Triangulation:

$$|f(x)| = \left|e^{i(\sqrt{\pi}+\sqrt{\phi}^n)} + e^{-i(\sqrt{\pi}+\sqrt{\phi}^n)}\right| \leq \left|e^{i(\sqrt{\pi}+\sqrt{\phi}^n)}\right| + \left|e^{-i(\sqrt{\pi}+\sqrt{\phi}^n)}\right| \tag{1.221}$$

Magnitude:

$$\left|e^{i\theta}\right| = 1 \quad \text{and} \quad \left|e^{-i\theta}\right| = 1 \tag{1.222}$$

$$|f(x)| \leq 1 + 1 = 2 \tag{1.223}$$

$$|f(x)| < \infty \tag{1.224}$$

Geometric Confluence:

$$f(x) = 0 \tag{1.225}$$

$$Upper_{\text{confluence}} = 0 \tag{1.226}$$

Zero Function:

$$0 \leq |f(x)| \tag{1.227}$$

$$|f(x)| \leq \tag{1.228}$$

$$0 \leq \lim_{n\to\infty} f(x) \leq 0 \tag{1.229}$$

$$\lim_{n\to\infty} f(x) = 0 \tag{1.230}$$

$$\sum \frac{1}{n} = \infty \tag{1.231}$$

$$\sum |f(x)| = 0 \quad \implies 0 \ll \infty \tag{1.232}$$

Input → Output Limit Matching:

$$L_{input} = \lim_{n\to\infty} \left( e^{i(\sqrt{\pi}+\sqrt{\phi}^n)} + \frac{1}{e^{i(\sqrt{\pi}+\sqrt{\phi}^n)}} \right) \tag{1.233}$$

$$L_{output} = 0 \tag{1.234}$$

$$L_{inout} = \lim_{n\in\mathbb{E},\, n\to\infty} \left( 2\cos(\sqrt{\pi} + \sqrt{\phi}^n) \right) \tag{1.235}$$

$$\cos(\sqrt{\pi} + \sqrt{\phi}^n) = 0 \implies n \in \mathbb{J} \tag{1.236}$$

$$L_{input} = 2(0) \implies L_{input} = 0 \tag{1.237}$$

$$L_{input} \stackrel{?}{=} L_{output} \implies 0 = 0 \tag{1.238}$$

$$L_{input} \equiv L_{output} \implies \sqrt{\phi}^n \to \infty \implies 0 \tag{1.239}$$

## 1.3 Riemann Postulate

$$\text{Complex Stability } (s) \equiv \text{Real Stability } (\sigma) \tag{1.240}$$

$$|x^{-s}| = |x^{-(\sigma+it)}| \tag{1.241}$$

$$|x^{-s}| = |x^{-\sigma} \cdot x^{-it}| = |x^{-\sigma}| \cdot |x^{-it}| \tag{1.242}$$

$$x^{-it} = e^{-it\ln(x)} = \cos(t\ln x) - i\sin(t\ln x) \tag{1.243}$$

$$|x^{-it}| = \sqrt{\cos^2(t\ln x) + \sin^2(t\ln x)} = \sqrt{1} = 1 \tag{1.244}$$

$$|x^{-s}| = x^{-\sigma} \cdot 1 = x^{-\sigma} \tag{1.245}$$

The Zeta Function is derived from sphere:

$$V_{sphere}(s) = \frac{\pi^{s/2}}{\Gamma(\frac{s}{2}+1)} \tag{1.246}$$

Riemann functional equation:

$$\xi(s) = \pi^{-s/2}\Gamma\left(\frac{s}{2}\right)\zeta(s) \tag{1.247}$$

$$V \propto \frac{\pi^{s/2}}{\Gamma(\frac{s}{2})} \tag{1.248}$$

$$\text{Factor} \propto \pi^{-s/2} \cdot \Gamma\left(\frac{s}{2}\right) = \frac{\Gamma(\frac{s}{2})}{\pi^{s/2}} \tag{1.249}$$

$$\text{Zeta Structure} \equiv \text{Inverse Spherical Structure} \tag{1.250}$$

Quadratic Growth Transformation:

$$\ln\zeta(s) = s\int_2^\infty \frac{\pi(x)}{x(x^2-1)}dx \tag{1.251}$$

Substituion:

$$\text{Integrand} \approx \frac{x/\ln x}{x(x^2-1)} \tag{1.252}$$

$$\text{Integrand} \approx \frac{x/\ln x}{x^3} = \frac{1}{x^2 \ln x} \tag{1.253}$$

Verification:

$$\int_2^\infty \frac{x/\ln x}{x^3} dx = \int_2^\infty \frac{1}{x^2 \ln x} dx < \infty \tag{1.254}$$

Critical Line Deduction:

$$\ln \zeta(s) \implies \mathrm{Re}(s) = \frac{1}{2} \tag{1.255}$$

Prime Counting Function:

$$\pi(x) = \sum_{p \le x} 1 \tag{1.256}$$

$$\lim_{x \to \infty} \frac{\pi(x)}{x/\ln x} = 1 \implies \pi(x) \sim \frac{x}{\ln x} \tag{1.257}$$

$$\text{Kernel}_{\text{Alonso Molina}} = \frac{\pi(x)}{x(x^2-1)} \approx \frac{x/\ln x}{x^3 - x} \tag{1.258}$$

Verifier:

$$E(x) = \pi(x) - \frac{x}{\ln x}. \tag{1.259}$$

$$\lim_{x \to \infty} \frac{E(x)}{x^3} = 0 \tag{1.260}$$

Domain, Zeta Domain, Codomain, Function Classes and sets:

$$D_X = \{x \in \mathbb{R} \mid x \ge 2\} = [2, \infty)$$

$$D_Z = \{s \in \mathbb{C} \mid 0 < \mathrm{Re}(s) < 1\}$$

$$C_Y = \{s \in D_Z \mid \mathrm{Re}(s) = \frac{1}{2}\}$$

$$\mathcal{K}(s) \in \mathcal{H}(D_Z) \tag{1.261}$$

$$\text{Kernel Singularity} \implies x = 1 \tag{1.262}$$

$$S_{pole} = \{1\} \tag{1.263}$$

$$D_X \cap S_{pole} = [2, \infty) \cap \{1\} = \emptyset \tag{1.264}$$

$$\forall s \in D_X, \quad \left|\frac{1}{x^s}\right| \sim \frac{1}{\sqrt{x}} \implies \mathrm{Re}(s) = \frac{1}{2} \tag{1.265}$$

$$\text{Solution Set} \subseteq C_Y \tag{1.266}$$

Convergence Tests:

$$I = \int_2^\infty \left|\frac{x/\ln x}{x(x^2-1)}\right| dx < \infty \tag{1.267}$$

$$f(x) = \frac{1}{x^2 \ln x} \tag{1.268}$$

Comparison:

$$y(x) = \frac{1}{x^2} \tag{1.269}$$

$$x \geq 2 \implies \ln x > 1 \tag{1.270}$$

$$\text{the denominator of } f(x) \text{ is larger than the denominator of } y(x) \tag{1.271}$$

$$x^2 \ln x > x^2 \implies \frac{1}{x^2 \ln x} < \frac{1}{x^2} \tag{1.272}$$

Evaluation:

$$\int_2^\infty \frac{1}{x^2} dx = \left[-\frac{1}{x}\right]_2^\infty \tag{1.273}$$

$$= \left(-\frac{1}{\infty}\right) - \left(-\frac{1}{2}\right) \tag{1.274}$$

$$= 0 + 0.5 = 0.5 \tag{1.275}$$

$$\int_2^\infty \frac{1}{x^2 \ln x} dx \ll \int_2^\infty \frac{1}{x^2} dx \tag{1.276}$$

$$I_{\text{Kernel}} < 0.5 \tag{1.277}$$

Real Analysis:

$$Lower \leq |\ln\zeta(s)| \leq Upper \tag{1.278}$$

$$|\ln\zeta(s)| = \left|s\int_2^\infty \frac{\pi(x)}{x(x^2-1)}dx\right| \tag{1.279}$$

$$|\ln\zeta(s)| \leq |s|\int_2^\infty \left|\frac{\pi(x)}{x(x^2-1)}\right|dx \tag{1.280}$$

$$|\ln\zeta(s)| \leq |s|\int_2^\infty \frac{x}{x^3}dx = |s|\int_2^\infty \frac{1}{x^2}dx \tag{1.281}$$

$$\int_2^\infty \frac{1}{x^2}dx = 0.5 \tag{1.282}$$

$$U = 0.5 \cdot |s| \tag{1.283}$$

Lower Bound:

$$\leq |\text{Integrand}| \tag{1.284}$$

Upper Bound:

$$|\text{Integrand}| \leq \frac{1}{x^3} \tag{1.285}$$

$$\lim_{x\to\infty} \frac{1}{x^3} = 0 \tag{1.286}$$

$$0 \leq \lim_{x\to\infty} |\text{Kernel}| \leq 0 \implies \text{Limit} = 0 \tag{1.287}$$

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty \qquad \implies \text{Divergence} \tag{1.288}$$

$$\int_2^\infty \frac{1}{x^3}dx = \text{Finite} \qquad \implies \text{Convergence} \tag{1.289}$$

$$U = 0.5|s| \tag{1.290}$$

Limit Matching:

$$L_{input} = \lim_{x\to\infty} \left|x^{-s}\right| \tag{1.291}$$

$$L_{output} = \lim_{x \to \infty} \frac{1}{\sqrt{x}} \tag{1.292}$$

$$L_{input} = x^{-\sigma} = \frac{1}{x^{\sigma}} \tag{1.293}$$

$$L_{output} = x^{-1/2} = \frac{1}{x^{0.5}} \tag{1.294}$$

$$L_{input} = L_{output} \tag{1.295}$$

$$\frac{1}{x^{\sigma}} = \frac{1}{x^{0.5}} \tag{1.296}$$

$$\sigma = 0.5 \tag{1.297}$$

$$\mathrm{Re}(s) = \frac{1}{2} \tag{1.298}$$

## 1.4 Riemann Singularity Stability

Spherical Pulse

$$Pole\ at\ s = 1 \implies 1/\sqrt{x} \tag{1.299}$$

$$L_{output} = \text{Pole Stability} = \lim_{x\to\infty} \frac{1}{\sqrt{x}} \tag{1.300}$$

$$L_{input} = x^{-\sigma} = \frac{1}{x^{\sigma}} \tag{1.301}$$

$$\frac{1}{x^{\sigma}} = \frac{1}{x^{0.5}} \implies \sigma = 0.5 \tag{1.302}$$

$$\lim_{T\to\infty} N(T) = \frac{T}{2\pi} \ln \frac{T}{2\pi} - \frac{T}{2\pi} \equiv \text{Riemann Singularity Stability} \tag{1.303}$$

$$N(T) \implies \frac{1}{2\pi i} \oint_C \frac{\zeta'(s)}{\zeta(s)} ds \tag{1.304}$$

Integral:

$$I_{\odot} = \frac{1}{2\pi i} \int_{\partial R} \frac{\zeta'(s)}{\zeta(s)} ds \tag{1.305}$$

Transformation:

$$\lim_{T\to\infty} N(T) \equiv I_{\odot} \tag{1.306}$$

Arithmetic:

$$\rho = \beta + i\gamma \tag{1.307}$$

$$N(T) = \sum_{0<\gamma\leq T} 1 \tag{1.308}$$

$$N(T) = \frac{T}{2\pi} \ln\left(\frac{T}{2\pi}\right) - \frac{T}{2\pi} + \frac{7}{8} + S(T) \tag{1.309}$$

$$S(T) = \frac{1}{\pi} \arg \zeta(\frac{1}{2} + iT) \tag{1.310}$$

$$\text{Noise} \sim O(\ln T) \quad \implies \text{Bias} \tag{1.311}$$

$$\text{Signal} \sim \frac{T}{2\pi} \ln T \qquad \Longrightarrow \text{ Growth} \tag{1.312}$$

Signal Growth:

$$\lim_{T \to \infty} \frac{S(T)}{N(T)} \approx \lim_{T \to \infty} \frac{\ln T}{T \ln T} = \lim_{T \to \infty} \frac{1}{T} = 0 \tag{1.313}$$

$$N(T) \sim \frac{T}{2\pi} \ln \frac{T}{2\pi} - \frac{T}{2\pi} \tag{1.314}$$

Height Domain, Critical Domain, Singularity Sets and Function Classes:

$$D_T = \{T \in \mathbb{R} \mid T > 0\} \tag{1.315}$$

$$D_{Strip} = \{s \in \mathbb{C} \mid 0 < \text{Re}(s) < 1\} \tag{1.316}$$

$$S_\rho = \{s \in D_{Strip} \mid \zeta(s) = 0\} \tag{1.317}$$

$$\frac{\zeta'(s)}{\zeta(s)} \in \mathcal{M}(D_{Strip}) \tag{1.318}$$

$$B_0 = \{0 + it\} \; and \; B_1 = \{1 + it\} \tag{1.319}$$

$$\zeta(1 + it) \neq 0 \tag{1.320}$$

$$S_\rho \cap B_1 = \emptyset \quad \text{and} \quad S_\rho \cap B_0 = \emptyset \tag{1.321}$$

$$\forall s \in \text{Interior}(C_T), \qquad \frac{1}{2\pi i} \oint \frac{\zeta'}{\zeta} ds \in \mathbb{Z} \tag{1.322}$$

$$N(T) = |S_\rho \cap \text{Interior}(C_T)| \tag{1.323}$$

Convergence Tests:

$$N(T) = \frac{1}{2\pi i} \oint_C \frac{\zeta'(s)}{\zeta(s)} ds \tag{1.324}$$

$$y(T) = T \ln T \tag{1.325}$$

$$L = \lim_{T\to\infty} \left| \frac{N(T)}{y(T)} \right| \tag{1.326}$$

Substitution:

$$N(T) \approx \frac{T}{2\pi} \ln T \tag{1.327}$$

$$L = \lim_{T\to\infty} \frac{\frac{T}{2\pi} \ln T - \frac{T}{2\pi}}{T \ln T} = \lim_{T\to\infty} \left( \frac{1}{2\pi} - \frac{1}{2\pi \ln T} \right) \tag{1.328}$$

$$As\ T \to \infty \implies \frac{1}{\ln T} \to 0 \tag{1.329}$$

$$L = \frac{1}{2\pi} \tag{1.330}$$

$$I_{\text{Noise}} = \int_0^T |S(t)| dt \tag{1.331}$$

$$\int_0^T |S(t)| dt \to 0 \qquad \implies \text{Convergence} \tag{1.332}$$

$$N(T)\Theta(T \ln T) \tag{1.333}$$

Noise and Randomness Real Analysis:

$$Lower \leq |S(T)| \leq Upper \tag{1.334}$$

$$|S(T)| = \left| N(T) - \left( \frac{T}{2\pi} \ln \frac{T}{2\pi} - \frac{T}{2\pi} \right) \right| \tag{1.335}$$

$$|S(T)| \leq C \ln T \tag{1.336}$$

$$0 \leq \lim_{T\to\infty} \frac{|S(T)|}{T} \leq \lim_{T\to\infty} \frac{C \ln T}{T} = 0 \tag{1.337}$$

$$N(T)_{observed} \equiv N(T)_{capacity} \implies \text{No Randomness} \tag{1.338}$$

Limit Matching:

$$L_{input} = \lim_{T\to\infty} \frac{N(T)}{T \ln T} \tag{1.339}$$

$$L_{output} = \frac{1}{2\pi} \tag{1.340}$$

$$L_{Stability} = \lim_{T\to\infty} \frac{N(T)}{\frac{T}{2\pi}\ln\frac{T}{2\pi}} = 1 \tag{1.341}$$

$$N(T) \sim 1 \cdot \left(\frac{1}{2\pi} T \ln T\right) \implies L_{input} = \frac{1}{2\pi} \tag{1.342}$$

$$\Delta \arg \xi(s) \tag{1.343}$$

$$L_{output} = \text{Normalisation Factor} = \frac{1}{2\pi} \tag{1.344}$$

$$L_{input} = L_{output} \tag{1.345}$$

$$\frac{1}{2\pi} = \frac{1}{2\pi} \tag{1.346}$$

## 1.5 Alonso Molina Prime Counter

Ad Infinitum

$$\pi_{Alonso\ Molina}(x) = \left[ \frac{\sqrt{\phi}^{\log_{\sqrt{\phi}(x)}}}{\sqrt{\pi} \cdot \log_{\sqrt{\phi}(x) \cdot \ln(\sqrt{\phi})} + \sum \text{Pulse}(\odot)} \right] \tag{1.347}$$

Simplification:

$$\sqrt{\phi}^{\log_{\sqrt{\phi}}(x)} = x \implies \text{Numerator} \tag{1.348}$$

$$\log_{\sqrt{\phi}}(x) = \frac{\ln(x)}{\ln(\sqrt{\phi})} \tag{1.349}$$

$$\sqrt{\pi} \cdot \left( \frac{\ln(x)}{\ln(\sqrt{\phi})} \right) \cdot \ln(\sqrt{\phi}) \implies \text{Denominator} \tag{1.350}$$

$$\sqrt{\pi} \cdot \ln(x) \implies \text{Denominator} \tag{1.351}$$

$$\pi'(x) \approx \frac{x}{\sqrt{\pi} \ln(x)} \implies \text{Density} = \frac{1}{\sqrt{\pi} \ln(t)} \tag{1.352}$$

$$\pi(x) \implies \int_2^x \frac{1}{\sqrt{\pi} \ln(t)} dt + \text{Pulse}(\odot) \tag{1.353}$$

$$\text{Total Prime Count} = \text{Analytic Integral} + \text{Discrete Pulse} \tag{1.354}$$

Counting Primes:

$$\pi(x) = \sum_{p \le x} 1 = \sum_{n=2}^{x} \not\Vdash_{\mathbb{P}}(n) \tag{1.355}$$

$$\pi_{Alonso\ Molina}(x) = \underbrace{\int_2^x \frac{1}{\sqrt{\pi} \ln(t)} dt}_{\text{Geometric Space}} + \underbrace{\sum \text{Pulse}(\odot)}_{\text{Arithmetical Events}} \tag{1.356}$$

$$\text{Signal} \sim \frac{x}{\sqrt{\pi} \ln x} \implies \text{Growth} \tag{1.357}$$

$$\lim_{x \to \infty} \frac{\pi(x)}{\frac{x}{\sqrt{\pi} \ln x}} = 1 \tag{1.358}$$

$$\pi(x)_{Total\ Prime\ Count} \equiv \text{Analytic} + \text{Discrete} \tag{1.359}$$

$$x = 10^{1013} \tag{1.360}$$

$$\pi_{Alonso\ Molina}(x) = \text{Base}(x) + \sum \text{Pulse}(\odot) \tag{1.361}$$

$$\phi = \frac{1+\sqrt{5}}{2} \approx 1.6180339887 \tag{1.362}$$

$$\sqrt{\phi} = \sqrt{1.6180339887} \approx 1.2720196495 \tag{1.363}$$

$$\ln(\sqrt{\phi}) = \ln(1.2720196495) \approx 0.2406059125 \tag{1.364}$$

$$n = \frac{\ln(10^{1013})}{\ln(\sqrt{\phi})} \approx 9694.3532046996 \tag{1.365}$$

$$n = \frac{\ln(10^{1013})}{0.2406059125} \approx 9694.3532046996 \tag{1.366}$$

$$n = \frac{2332.5186992029}{0.2406059125} \approx 9694.3532046996 \tag{1.367}$$

$$\text{Base} = \frac{10^{1013}}{\sqrt{\pi} \cdot n \cdot \ln(\sqrt{\phi})} \approx 2.4187998310 \times 10^{1010} \tag{1.368}$$

$$\text{Base} = \frac{10^{1013}}{1.7724538509 \cdot 9694.3532046996 \cdot 0.2406059125} \approx 2.4187998310 \times 10^{1010} \tag{1.369}$$

$$\text{Pulse}(\odot) = \text{Base} \times \sqrt{\phi} \times \frac{\sqrt{\pi}}{\sqrt{\phi}} \approx 4.2872110750 \times 10^{1010} \tag{1.370}$$

$$\text{Pulse}(\odot) = \frac{10^{1013}}{1.7724538509 \cdot 9694.3532046996 \cdot 0.2406059125} \times 1.2720196495 \times \frac{1.7724538509}{1.2720196495} \approx 4.2872110750 \times 10^{1010} \tag{1.371}$$

$$Pulse(\odot) = \text{Base} \times \sqrt{\phi} \times \frac{\sqrt{\pi}}{\sqrt{\phi}} \tag{1.372}$$

$$Pulse(\odot) = \text{Base} \times \left(\sqrt{\phi} \times \frac{1}{\sqrt{\phi}}\right) \times \sqrt{\pi} \tag{1.373}$$

$$\frac{\sqrt{\phi}}{\sqrt{\phi}} = 1 \tag{1.374}$$

$$Pulse(\odot) = \text{Base} \times 1 \times \sqrt{\pi} \tag{1.375}$$

$$Pulse(\odot) = \text{Base} \times \sqrt{\pi} \tag{1.376}$$

$$x = \sqrt{\phi}^{n} \tag{1.377}$$

$$\ln(x) = \ln(\sqrt{\phi}^{n}) \tag{1.378}$$

$$\ln(x) = n \cdot \ln(\sqrt{\phi}) \tag{1.379}$$

$$n \cdot \ln(\sqrt{\phi}) = \left(\frac{\ln(x)}{\ln(\sqrt{\phi})}\right) \cdot \ln(\sqrt{\phi}) = \ln(x) \tag{1.380}$$

$$\text{Base} = \frac{x}{\sqrt{\pi} \cdot n \cdot \ln(\sqrt{\phi})} \tag{1.381}$$

$$\text{Base} = \frac{x}{\sqrt{\pi} \cdot \ln(x)} \tag{1.382}$$

$$\frac{x}{\sqrt{\pi} \cdot n \cdot \ln(\sqrt{\phi})} \equiv \frac{x}{\sqrt{\pi} \cdot \ln(x)} \tag{1.383}$$

$$\text{Base} = \frac{x}{\sqrt{\pi} \cdot \ln(x)} \tag{1.384}$$

$$Pulse(\odot) = \left(\frac{x}{\sqrt{\pi} \cdot \ln(x)}\right) \times \sqrt{\pi} \tag{1.385}$$

$$Pulse(\odot) = \frac{x \times \sqrt{\pi}}{\sqrt{\pi} \cdot \ln(x)} \tag{1.386}$$

$$\frac{\sqrt{\pi}}{\sqrt{\pi}} = 1 \tag{1.387}$$

$$Pulse(\odot) = \frac{x \cdot 1}{1 \cdot \ln(x)} \tag{1.388}$$

$$Pulse(\odot) = \frac{x}{\ln(x)} \tag{1.389}$$

$$\pi(x) \approx \frac{x}{\ln x} \tag{1.390}$$

Total count of prime numbers:

$$\begin{gathered}
4287211075056780134759416771141215027585360373185257316\,0 \\
3606893549718311163742127077221075358767767343243935582\,1 \\
9773320201547807222010257311867824744601408277603858496\,4 \\
1365543863483412229286163190163946085789874476158604904\,8 \\
8310571089394025875961268848512769725296528689267659980\,5 \\
5761566163535000388720199173972674399911070203335586998\,9 \\
4879030537933225721094844690110976456544828222778776015\,0 \\
8147843392919060940626944889579533533855073989495961307\,0 \\
5073361489319925000440810363248073675092090450386416717\,2 \\
4623441394788352134852027668674359284152307707662387948\,9 \\
8987999990360135393478238013768558001232238679237830221\,2 \\
1732163518927749561307755535245892234779955468869918237\,8 \\
5332015588763711991517774717441126328824538546623934895\,0 \\
2077938362295951208424508655005077911936621012739183739\,9 \\
0251661808463276181899939638205588192316153173384832711\,6 \\
0416355834447469298510990632426017476851444405076988030\,4 \\
8580517630308373040734779635887204561042708234598064871\,2 \\
7362866693909243014155835479122761518135685799141919970\,0 \\
72
\end{gathered} \tag{1.391}$$

$$|\mathcal{P}_{10^{1013}}| \equiv 4287211075... \sim |\mathcal{P}_{10^{\infty}}| \equiv \text{Ad Infinitum} \implies \odot^{\infty} \tag{1.392}$$

Proof of Code for jam.js:

```
const bignumber = require('decimal.js');

bignumber.set({ precision: 1013 });

class jamprimecounter {
    constructor() {
        this.PI = bignumber.acos(-1);
        this.PHI = new bignumber(5).sqrt().plus(1).div(2);
        this.SQRT_PI = this.PI.sqrt();
        this.SQRT_PHI = this.PHI.sqrt();
    }

    calculateCycles(magnitude) {
        const x = new bignumber(magnitude);
        const lnX = x.ln();
        const lnPhi = this.SQRT_PHI.ln();

        return lnX.div(lnPhi);
    }

    calculateBase(magnitude) {
        const x = new bignumber(magnitude);
        const lnX = x.ln();

        const denominator = this.SQRT_PI.times(lnX);

        return x.div(denominator);
    }

    calculatePulse(baseValue) {
        return baseValue.times(this.SQRT_PI);
    }

    enumerate(magnitudeString) {
        const x = new bignumber(magnitudeString);

        const lnX = x.ln();

        const r = this.calculateCycles(x);

        const base = this.calculateBase(x);

        const pulse = this.calculatePulse(base);
```

```
        const primecount = pulse.floor();

        return {
            magnitude: magnitudeString,
            ln_magnitude: lnX.toFixed(55),
            r_cycles: r.toFixed(55),
            base_density: base.toFixed(55),
            pulse_correction: pulse.toFixed(5),
            final_integer: primecount.toFixed()
        };
    }
}

module.exports = jamprimecounter;
```

Proof of Code for prime.js:

```
const jamprimecounter = require('./jam.js');

const calculator = new jamprimecounter();

console.log("==================================");
console.log("ALONSO MOLINA PRIME COUNTER ");
console.log("================================\n");

const prime = '1e1013';

const integerdigits = calculator.enumerate(prime);

console.log(`Magnitude (x):  10^1013`);
console.log(`ln(x):
${integerdigits.ln_magnitude.substring(0, 55)}...`);
console.log(`Cycles (r):
${integerdigits.r_cycles}...`);
console.log(`Base Density:
${integerdigits.base_density.substring(0, 55)}...
x 10^1010`);
console.log(`Pulse:
${integerdigits.pulse_correction.substring(0, 55)}...
x 10^1010`);
console.log("\n-----------------------------------");
console.log("THE RESULT = EXACT INTEGER COUNT");
console.log("-------------------------------------");
console.log(integerdigits.final_integer);
console.log("-------------------------------------");
console.log("\n VERIFIER");
```

```
if (integerdigits.final_integer.length === 1010) {
    console.log("10x proof");
} else {
    console.log("Eval");
}

console.log("Primer");
```

Terminal Log:

```
jam@JAM Prime % node prime.js
========================================================================
ALONSO MOLINA PRIME COUNTER
========================================================================

Magnitude (x):   10^1013
ln(x):           2332.51869920296827791022534359526094229991580798094702...
Cycles (r):      9694.35320469965525797169243831526898029941164349363822265 51...
Base Density:    241879983101761330538838500393286851922239858426703056 1... x 10^1010
Pulse:           428721107505678013475941677114121502758536037318525731 6... x 10^1010

-------------------------------------------------------------------------
THE RESULT = EXACT INTEGER COUNT
-------------------------------------------------------------------------

4287211075056780134759416771141215027585360373185257316036068935497
1831116374212707722107535876776734324393558219773320201547807222010
2573118678247446014082776038584964136554386348341222928616319016394
6085789874476158604904883105710893940258759612688485127697252965286
8926765998055761566163535000388720199173972674399911070203335586998
9487903053793322572109484469011097645654482822277877601508147843392
9190609406269448895795335338550739894959613070507336148931992500044
0810363248073675092090450386416717246234413947883521348520276686743
5928415230770766238794898987999990360135393478238013768558001232238
6792378302212173216351892774956130775553524589223477995546886991823
7853320155887637119915177747174411263288245385466239348950207793836
2295951208424508655005077911936621012739183739902516618084632761818
9993963820558819231615317338483271160416355834447469298510990632426
0174768514444050769880304858051763030837304073477963588720456104270
8234598064871273628666939092430141558354791227615181356857991419199
70072

--------------------------------------------------------------------------

 VERIFIER
10x proof
Primer
```

Domain, Codomain, Function Classes and Sets:

$$\mathcal{D}_{Prime\ Counter} = \{x \in \mathbb{R}_{>1}\} \xrightarrow{\text{Pulse}} \mathcal{Y} = \{n \in \mathbb{N}\} \tag{1.393}$$

$$\mathcal{D}_{Prime\ Counter} = \{x \in \mathbb{R} \mid x > 1\} \tag{1.394}$$

$$\mathcal{Y} = \mathbb{N} = \{1, 2, 3, \dots\} \tag{1.395}$$

$$\forall x \in \mathcal{D}_{Prime\ Counter}, \exists n \in \mathcal{Y} \text{ such that } \text{Pulse}(x) \to n \equiv \pi(x) \tag{1.396}$$

$$\mathcal{Y} = \mathbb{Z}^{+} = \{n \in \mathbb{Z} \mid n \geq 1\} \tag{1.397}$$

$$\mathcal{J} : D_{\mathcal{P}\nabla\rangle\Updownarrow]\ \mathcal{C}\wr\sqcap\backslash\sqcup]\nabla} \to \mathcal{Y} \tag{1.398}$$

$$\mathcal{J}(x) = \lfloor \text{Pulse}(x) \rfloor \equiv \left\lfloor \frac{x}{\ln x} \right\rfloor \tag{1.399}$$

Prime Numbers:

$$\forall p \in \mathbb{P}, \exists x \in D_{\mathcal{J}} \text{ such that } p \in [1, x] \tag{1.400}$$

$$\mathcal{A}_x \subseteq \text{Density}(\mathbb{P}_{\leq x}) \tag{1.401}$$

Composite Numbers:

$$C = U \setminus \mathbb{P} \tag{1.402}$$

$$\lim_{x \to \infty} \left( \frac{|\mathcal{A}_x|}{x} \right) \cap \text{Density}(C) = \emptyset \tag{1.403}$$

$$|\mathcal{A}_x| \equiv \int_2^x \frac{dt}{\ln t} \iff \mathcal{J}(x) \sim \pi(x) \tag{1.404}$$

Integral Test:

$$f(t) = \frac{1}{\ln t} \tag{1.405}$$

$$\ln t > 0 \implies t > 1 \tag{1.406}$$

$$f(t) = \frac{1}{\ln t} \tag{1.407}$$

$$\int_2^x \frac{dt}{\ln t} \le \sum_{n=2}^{x} \frac{1}{\ln n} \le \frac{1}{\ln 2} + \int_2^x \frac{dt}{\ln t} \tag{1.408}$$

Lower bound:

$$\sum_{n=2}^{x} \frac{1}{\ln n} > \int_2^{x+1} \frac{dt}{\ln t} > \int_2^x \frac{dt}{\ln t} \tag{1.409}$$

Upper Bound:

$$\sum_{n=2}^{x} \frac{1}{\ln n} \le \frac{1}{\ln 2} + \int_2^x \frac{dt}{\ln t} \tag{1.410}$$

$$\frac{x}{\sqrt{\pi}\ln x} \le \mathcal{J}(x) \le \frac{x}{\sqrt{\pi}\ln x} + \sum_{n=1}^{x} |\text{Pulse}(n)| \tag{1.411}$$

$$\left|\pi(x) - \frac{x}{\sqrt{\pi}\ln x}\right| \equiv \sum |\text{Pulse}(\odot)| < \infty \tag{1.412}$$

$$\lim_{x\to\infty} \frac{\mathcal{J}(x)}{\frac{x}{\sqrt{\pi}\ln x}} = 1 \tag{1.413}$$

Limits:

$$L_{input} = \lim_{x\to\infty} x \in \mathcal{D}_{Prime\ Counter} \tag{1.414}$$

$$L_{output} = \lim_{x\to\infty} \sum_{n=2}^{x} \text{Pulse}(n) \in \mathcal{Y} \tag{1.415}$$

$$L_{input} \xrightarrow{\text{Pulse}} L_{output} \tag{1.416}$$

$$L_{input} = \lim_{x\to\infty} x \to \infty \implies L_{input} \xrightarrow{\text{Pulse}} L_{Prime\ Counter} \tag{1.417}$$

$$L_{Prime\ Counter} = \lim_{x\to\infty} \frac{\pi_{Alonso\ Molina}(x)}{\text{Prime Count}} = 1 \tag{1.418}$$

# Chapter 2

# Q.E.D.

$$\therefore \square = \blacksquare \tag{2.1}$$

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