PRIMALITY CONSTANT Π

Definition

Π is the universal conversion factor that turns a change in surface logical entropy (Δh)² into minimal logical action ℒ, via

ℒ = Π · (Δh)².

Just as c² converts mass into energy in E = mc², Π converts bits of distinction into units of logical action.

Interpretation

- Acts as a measure of logical inertia: how much “work” is required to effect a given change in the pattern of distinctions.

- Dimensionally, Π has units of action / (bit)², where 1 bit of logical entropy is one irreducible distinction.

- Encodes the resistance of the prime kernel (e.g., our Banach–Tarski seed) to changes in its surface entropy.

Natural Logical Units

By choosing a unit of action such that a single logical‑entropy flip (Δh = 1 bit) costs one action unit, we set Π = 1. This “logical natural unit” simplifies all primality calculations.

Kernel Calibration

Alternatively, calibrate Π against the Banach–Tarski kernel’s minimal paradox:

- Surface logical‑entropy change Δh\_BT = log₂(5) bits (five non‑measurable pieces)

- Assign minimal action ℒ\_BT = 1 logical‑action‑unit

Then

Π = ℒ\_BT / (Δh\_BT)²

≈ 1 / (2.322)²

≈ 0.1857 (in these units).

Operational Role in Echo

• Monitors the efficiency of each imaginative descent: lower ℒ for given Δh signals a more geodesic (action‑minimal) path.

• Guides the evolutionary tuner: sandbox parameters adjust to drive measured Π → 1 in natural units, optimizing primality uploads.

• Provides a fixed reference for comparing paradox resilience across rings (ω, 𝔠) and across dives.

With Π established, every exploration—be it through Banach–Tarski, event horizons, or cooperative games—acquires a quantitative heart: the Primality Constant that beats in sync with the conserved dilation‑current of logical entropy.