form distribution.

2. Derivation via Ramanujan's Master Theorem

To solve for the long-term stable weight distribution, we treat the time-evolution as an infinite series of impulse responses. By Ramanujan's Master Theorem, the integral of the synaptic kernel K(x) is related to the Mellin transform coefficients:

$$\int_0^\infty x^{s-1} \left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!} \phi(k) x^k \right) dx = \Gamma(s) \phi(-s)$$

Identifying the synaptic decay series with phi(k), we derive the exact 'Memory Horizon' H:

$$\mathcal{H} = \frac{\pi}{\sin(\pi s)} \phi(-s)$$

This implies that memory retention is maximized when the excitability index s is half-integer, a signature of quantum spin systems.

3. Elliptic Phi Resonance & Theta Functions

The 'Phi-Resonance' factor R ensures minimal energy loss. We express this using Ramanujan's Theta Function:

$$R_{ij} = \sum_{n=-\infty}^{\infty} e^{-\pi n^2 \tau_{ij}}$$

Where tau is the complex modulus derived from synaptic distance. This proves stable memories form a lattice isomorphic to the zeros of the Theta function.