Vexorithor: A Comprehensive Study

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1 Introduction

The theory of Vexorithor explores the vexorithorical properties of advanced mathematical systems, focusing on their abstract interactions and relationships. This document aims to rigorously define these properties and develop the associated mathematical framework.

2 Rigorous Definitions

2.1 Vexorithorical Space $\mathcal{V}$

A *vexorithorical space* $\mathcal{V}$ is a topological space equipped with a set of vexorithorical operations $\{\Omega_i\}_{i\in I}$, where each $\Omega_i : \mathcal{V} \to \mathcal{V}$ is a continuous function that defines a transformation in $\mathcal{V}$.

2.2 Vexorithorical Metric d_V

The *vexorithorical metric* $d_V : \mathcal{V} \times \mathcal{V} \to \mathbb{R}$ measures the distance between two points in a vexorithorical space. It satisfies:

1. Positivity: $d_V(x, y) \geq 0$ and $d_V(x, y) = 0 \iff x = y$
2. Symmetry: $d_V(x, y) = d_V(y, x)$
3. Triangle inequality: $d_V(x, z) \leq d_V(x, y) + d_V(y, z)$

2.3 Vexorithorical Transformation Ω

A *vexorithorical transformation* $\Omega : \mathcal{V} \to \mathcal{V}$ preserves the vexorithorical structure. For all $x, y \in \mathcal{V}$,

$$d_V(\Omega(x), \Omega(y)) = d_V(x, y)$$

2.4 Vexorithorical Function f_V

A *vexorithorical function* $f_V : \mathcal{V} \to \mathbb{R}$ respects the vexorithorical properties. For all $x, y \in \mathcal{V}$,

$$f_V(\Omega(x)) = f_V(x)$$

2.5 Vexorithorical Operator $\mathcal{O}_V$

A *vexorithorical operator* $\mathcal{O}_V : \mathcal{V} \to \mathcal{V}$ is linear and continuous, ensuring

$$\mathcal{O}_V(\alpha x + \beta y) = \alpha \mathcal{O}_V(x) + \beta \mathcal{O}_V(y) \quad \forall x, y \in \mathcal{V},\ \alpha, \beta \in \mathbb{R}$$

3 New Mathematical Formulas

3.1 Distance Formula in $\mathcal{V}$

The distance between two points x and y in $\mathcal{V}$ is given by

$$d_V(x, y) = \sup \{|f_V(x) - f_V(y)| : f_V \in \mathcal{F}_V\}$$

where $\mathcal{F}_V$ is the set of all vexorithorical functions.

3.2 Transformation Property

The transformation Ω satisfies the property

$$\Omega(\Omega(x)) = x \quad \forall x \in \mathcal{V}$$

3.3 Vexorithorical Function Identity

Vexorithorical functions are invariant under transformations:

$$f_V(\Omega(x)) = f_V(x) \quad \forall x \in \mathcal{V}$$

3.4 Operator Linearity

The vexorithorical operator $\mathcal{O}_V$ satisfies linearity:

$$\mathcal{O}_V(\alpha x + \beta y) = \alpha \mathcal{O}_V(x) + \beta \mathcal{O}_V(y) \quad \forall x, y \in \mathcal{V},\ \alpha, \beta \in \mathbb{R}$$

4 Conclusion

By rigorously defining and exploring the properties of vexorithor, we can deepen our understanding of these advanced mathematical systems and their interactions. This theory provides a foundation for further research and application in various mathematical contexts.

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