MAPPING CHANGE: A FUNCTIONAL PERSPECTIVE ON NATURAL SELECTION

Author: Farid Nazifi

Date: April 21, 2026

1. INPUT → PROCESS → OUTPUT

A mathematical function maps input to output (f(x)=y). Similarly, natural selection transforms populations via environmental pressures into adapted populations.

2. DEPENDENCE ON VARIABLES

In functions, outputs depend on inputs. In evolution, survival depends on traits and environmental conditions.

3. SELECTION AND CONSTRAINTS

Functions have domains and ranges. Natural selection is constrained by environmental limits and biological possibilities.

4. OPTIMIZATION

Functions can optimize values. Natural selection favors traits that improve survival and reproduction.

5. GRADUAL CHANGE

Functions can change continuously. Evolution occurs gradually across generations.

6. PREDICTABILITY VS. SENSITIVITY

Functions follow rules but can be sensitive. Evolution follows inheritance rules but includes variability and chance.

7. MAPPING RELATIONSHIPS

Functions map sets. Natural selection maps traits to survival and reproductive success.

FINAL INSIGHT

Evolution can be modeled as a function mapping traits and environments to outcomes.

FUNCTION TYPES

Includes polynomial, rational, radical, absolute value, exponential, logarithmic, trigonometric, injective, surjective, bijective, increasing/decreasing, periodic, constant, identity, piecewise, and inverse functions.

DARWIN’S THEORY

Key ideas: variation, overproduction, struggle for survival, survival of the fittest, inheritance, adaptation over time.

MODERN GENETICS

DNA explains inheritance. Mutations create variation. Recombination increases diversity. Fitness can be modeled mathematically.

REAL-WORLD EXAMPLE: ANTIBIOTIC RESISTANCE

Resistant bacteria survive antibiotics and reproduce, demonstrating natural selection in action.